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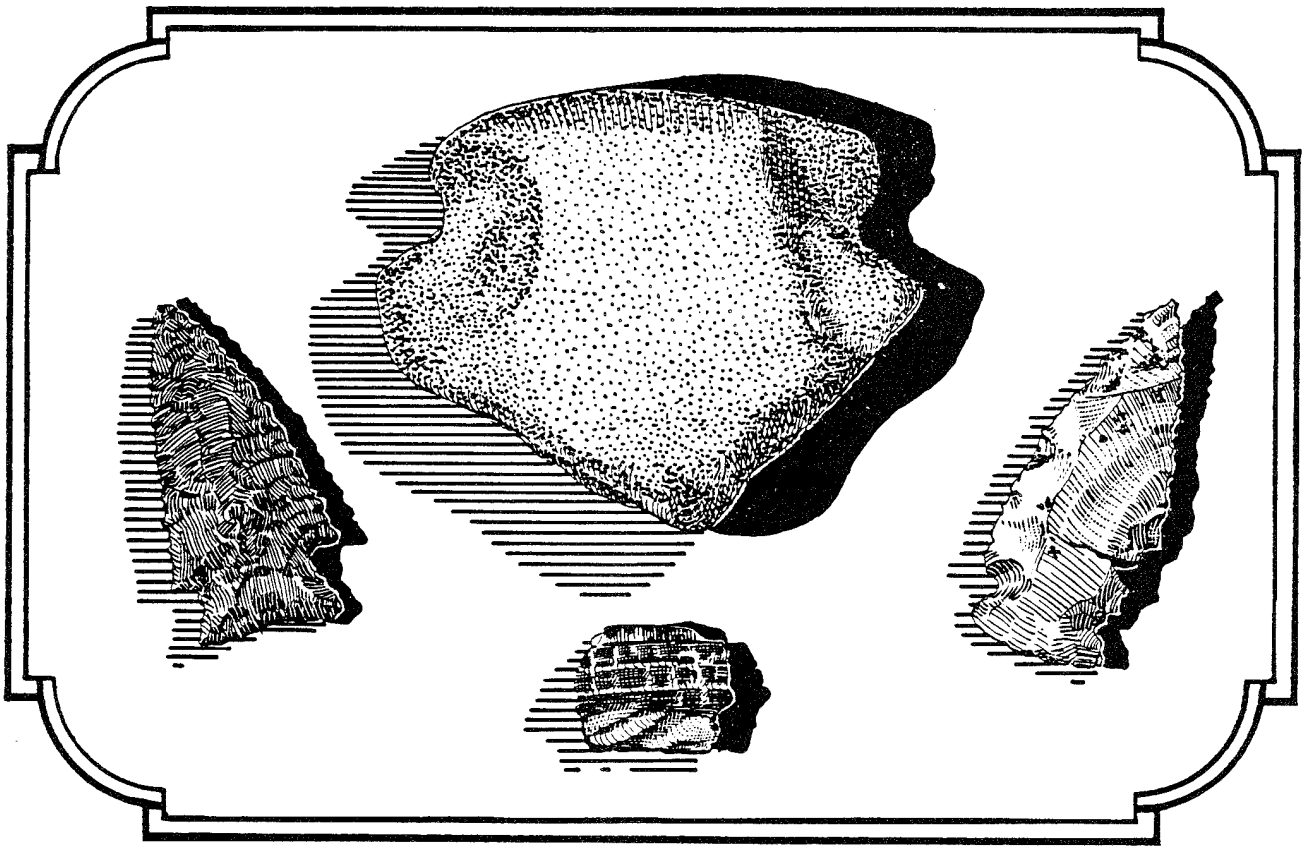

Lock Haven Phase I and II
Prehistoric Cultural Resources Inventory
and
Intensive Survey
Volume I
(ER-86-0405-035)

prepared for:
Greiner Engineering Sciences, Inc.
and
The U.S. Army Corps of Engineers, Baltimore District

April, 1987

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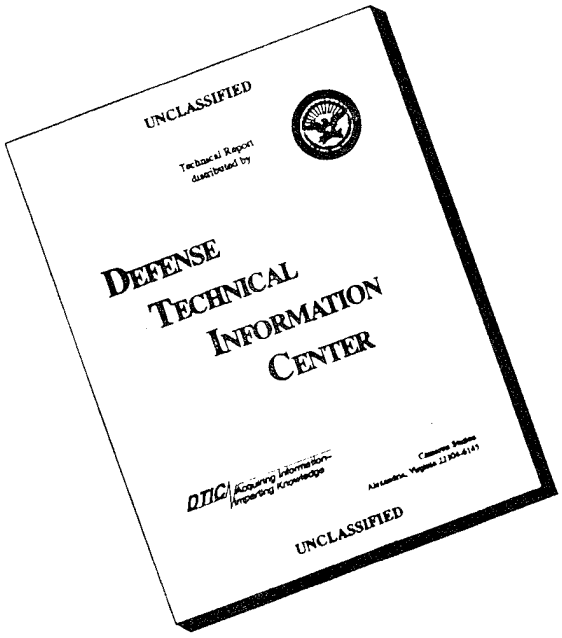

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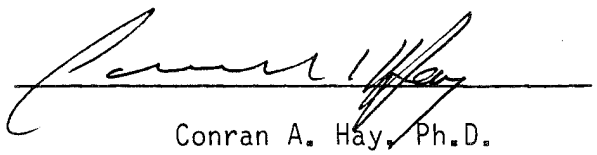

Conran A. Hay, Ph.D.
President

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1.0 MANAGEMENT SUMMARY AND RECOMMENDATIONS

1.1 Summary

During October 1985 through January 1986, Phase I site survey and Phase II site testing were conducted for selected portions of the Lock Haven Flood Protection Project area. This research was designed to discover all potentially significant archaeological resources within selected portions of the project area, and to evaluate selected resources for inclusion on the National Register of Historic Places.

Phase I survey procedures involved pedestrian surface survey, shovel tests, and deep augur probes. These procedures were used to discover archaeological sites in previously unsurveyed portions of the project area and to confirm the locations and boundaries of previously discovered archaeological sites. Phase I surveys were conducted within a strip of municipal park along Water Street between Sixth and Fourth Streets, along the U.S. Route 220 alignment, and at the Bald Eagle Creek upstream tie out. Surveys were proposed for the Susquehanna River upstream tie out and for a small parcel of AM-PM Mini Mart property immediately to the east of the Lock Haven University parking lot. However, access to these latter properties was denied and/or they exhibited extensive disturbance, thus precluding effective survey.

During Phase I survey, six previously unrecorded archaeological sites were discovered, and the locations of four previously recorded sites were confirmed. Previously unrecorded sites included 1) Water Street Site 2 (36Cn170) located in the above-mentioned strip of municipal park between Sixth and Fourth Streets; 2) Crissmans Site 4 (36Cn171) located along the U.S. Route 220 embankment in a large cultivated field; 3) Crissmans Site 5 (36Cn172), also located in the large cultivated field along the U.S. Route 220 embankment; 4) Cummings Site 3 (36Cn173), located along the U.S. Route 220 embankment to the west of Hanna Street; and 5) Cummings Sites 4 and 5 (36Cn174 and 36Cn177), located along the U.S. Route 220 embankment to the west of the Jay-Street connector.

Previously discovered sites included 1) the Island View Site (36Cn166), located within Island View Park just to the west of the Lock Haven University parking lot; 2) Crissmans Site 2 (36Cn167), located in the cultivated field along the U.S Route 220 embankment; 3) Crissmans Site 3 (36Cn168), also located in the cultivated field along U.S. Route 220; and 4) Cummings Site 2 (36Cn169), located along the U.S. Route 220 embankment to the west of the Jay-Street connector.

At six of the above-mentioned sites, Phase II testing was conducted to evaluate site eligibility for inclusion on the National Register of Historic Places. These six sites included the Island View Site, Crissmans Sites 2-5, and Cummings Site 2. Testing procedures involved the excavation of one to eight 2 m x 2 m test units within site boundaries. In addition, laboratory analyses of the artifacts recovered were conducted, and involved projectile point typology; identification of lithic raw materials;

classification of lithic artifacts by function; identification of ceramic artifact temper, surface treatment, and decorative motif; and classification of historic artifacts by material, function, and style.

The results of Phase II research at the Island View Site indicated that a deeply stratified, multi-component site was present. While the upper levels at the site consisted of disturbed historic and modern fill, the lower levels exhibited an intact, stratified cultural sequence spanning Late Archaic through Late Woodland times. These results indicated that the Island View Site should be considered eligible for inclusion on the National Register of Historic Places.

Phase II research at Crissmans Sites 2 and 3 confirmed that these sites represented low density, plow zone lithic scatters with little information potential. These results indicated that Crissmans Sites 2 and 3 were not eligible for inclusion on the National Register of Historic Places.

Phase II research at Crissmans Sites 4 and 5 indicated that these sites generally consisted of low density, plow zone lithic scatters. Unlike Crissmans Sites 2 and 3, however, Crissmans Sites 4 and 5 included subareas where higher artifact densities were present. These latter areas were identified as multi-component sites that had functioned primarily as small hunting camps or stations. In terms of general age and function, Crissmans Sites 4 and 5 had the potential to contribute useful information for settlement/subsistence system studies. However, since this information was provided by the present study, these sites were not considered eligible for inclusion on the National Register of Historic Places.

Similar results were obtained for Cummings Site 2. Like Crissmans Sites 4 and 5, Cummings Site 2 was identified as a multi-component, plow zone lithic scatter. In addition, the basic parameters of site age and function were identified, and indicated site occupations from Middle Archaic to Late Woodland times and use as a small hunting camp or station. The potential information content of the site was provided by the present study, and Cummings Site 2 was therefore considered to be ineligible for inclusion on the National Register of Historic Places.

At Water Street Site 2 and at Cummings Sites 3 and 4, only Phase I survey procedures were used. These procedures provided insufficient information to evaluate the National Register eligibility of Water Street Site 2 and Cummings Sites 3 and 4. At Cummings Site 5, Phase I survey procedures were again used. However, the low artifact density exhibited by this site indicated that it had little information potential, and was not eligible for inclusion on the National Register of Historic Places.

1.2 Recommendations

With the exception of several small properties to which access was denied, Phase I survey of the levee alignments covered by this study was comprehensive. With the exception of the Susquehanna River upstream

tie-out and a toxic drainageway, these small properties should be surveyed after rights-of-way have been acquired. Otherwise, no additional Phase I survey is recommended for the levee alignments covered by this study.

Insufficient information is presently available to assess the National Register eligibility of three sites within the area covered by this project. These sites include Water Street Site 2, Cummings Site 3, and Cummings Site 4. If subject to adverse project effects, it is therefore recommended that Phase II research, conforming to the standards and policies of the Pennsylvania Bureau for Historic Preservation, be conducted at these three sites. Recommendations for specific Phase II testing procedures are provided below (see Section 10.2).

During this study, Phase I and Phase II research was conducted at Crissmans Sites 2-5 and Cummings Site 2. Only Phase I research was conducted at Cummings Site 5. These sites were found to be ineligible for inclusion on the National Register of Historic Places. Regardless of project effects, no additional research at these sites is recommended.

Phase II research was also conducted at the Island View Site, and indicated that this site should be considered eligible for inclusion on the National Register of Historic Places based on the information it contains. The proposed levee alignment will pass through the site, and will destroy the small remnant of the site that presently remains intact. Unless an alternative alignment is selected, it is therefore recommended that data recovery be conducted at the Island View Site. Specific recommendations for data recovery procedures are provided below (see Section 10.3.2).

2.0 INTRODUCTION

The City of Lock Haven, Pennsylvania lies on the level, low-lying point of land formed by the confluence of Bald Eagle Creek and the West Branch of the Susquehanna River (Figure 2.1). Due to its topographic and hydrologic setting, the city has a long history of flood-related problems, culminating in the flooding which occurred during hurricane Agnes in 1972. To protect Lock Haven from such problems in the future, construction of a flood protection system has been proposed jointly by the City of Lock Haven and the U.S. Army Corps of Engineers, Baltimore District. This system will consist of earth levees following the perimeter of the city, tying in to high ground at its northwestern and southwestern outskirts (Figure 2.2).

For the purposes of description, the Lock Haven Flood Protection Project Area can be divided into a series of adjoining segments. At its northwestern terminus, the levee system will tie out on high ground just to the west of Lock Haven University. From this tie out, the system will extend to the east, traversing areas of fill and extensive disturbance to Island View Park. The levee system will then extend through Island View Park--a small, grass-covered area overlooking the West Branch of the Susquehanna River. It will then run parallel to the West Branch Bank, passing through a large asphalt parking lot owned by Lock Haven University, an AM-PM Mini Mart property, and two small, privately owned properties. Beyond the easternmost of these latter properties, the system follows a narrow strip of municipal park between the river and Water Street until reaching Fourth Street.

To the east of Fourth Street, the levee and flood wall system will continue to parallel the West Branch Bank, and will pass primarily through residential yards between Water Street and the West Branch until reaching the Jay Street Bridge. Between the Jay Street Bridge and Memorial Park, Water Street generally extends to the bank of the West Branch; in this area, the levee/flood wall will be placed at the northern (river side) margin of Water Street. It will then pass through Memorial Park and/or the Piper Airport until reaching Route T-375, which crosses the eastern extremity of the point of land upon which Lock Haven is situated. The levee system will then follow the western margin of Route T-375 to U.S. Route 220.

At the point where Route T-375 passes beneath U.S. Route 220, the levee system turns to the west and follows the U.S. Route 220 embankment to Bald Eagle Creek. Within this segment of the system, flood protection will be provided primarily by an impervious blanket placed on the southern side of the above-mentioned embankment. To the west of Bald Eagle Creek, the levee system crosses the lands of the Hammermill Paper Company, and ties out on high ground just across the old Pennsylvania Canal near Frederick and Canal Streets.

During a previous, reconnaissance-level archaeological survey of the above-described project (Hay et al. 1978), six prehistoric archaeological sites were identified within project area boundaries. In addition, the

Figure 2.1 Lock Haven and Its Immediate Surroundings.

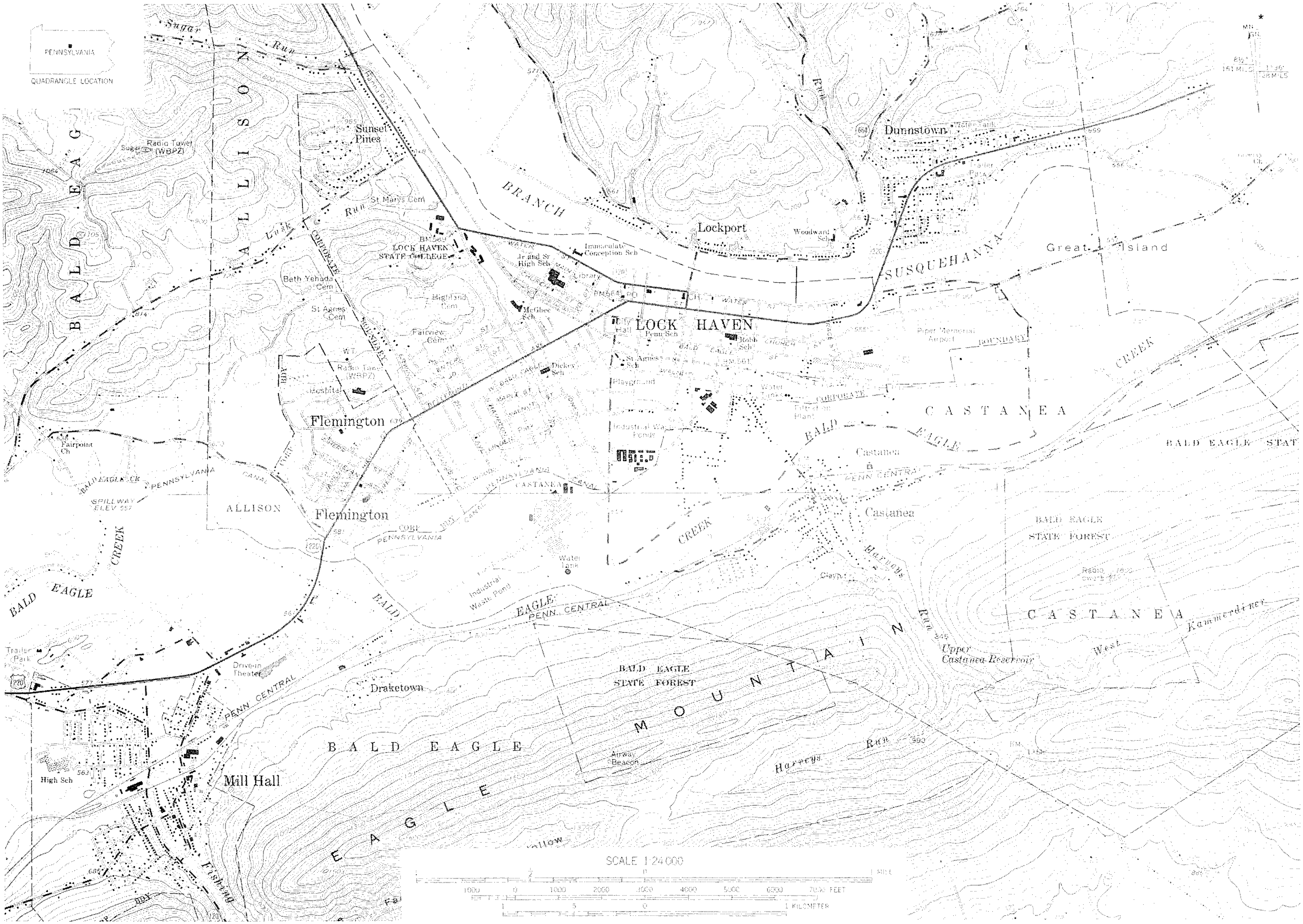
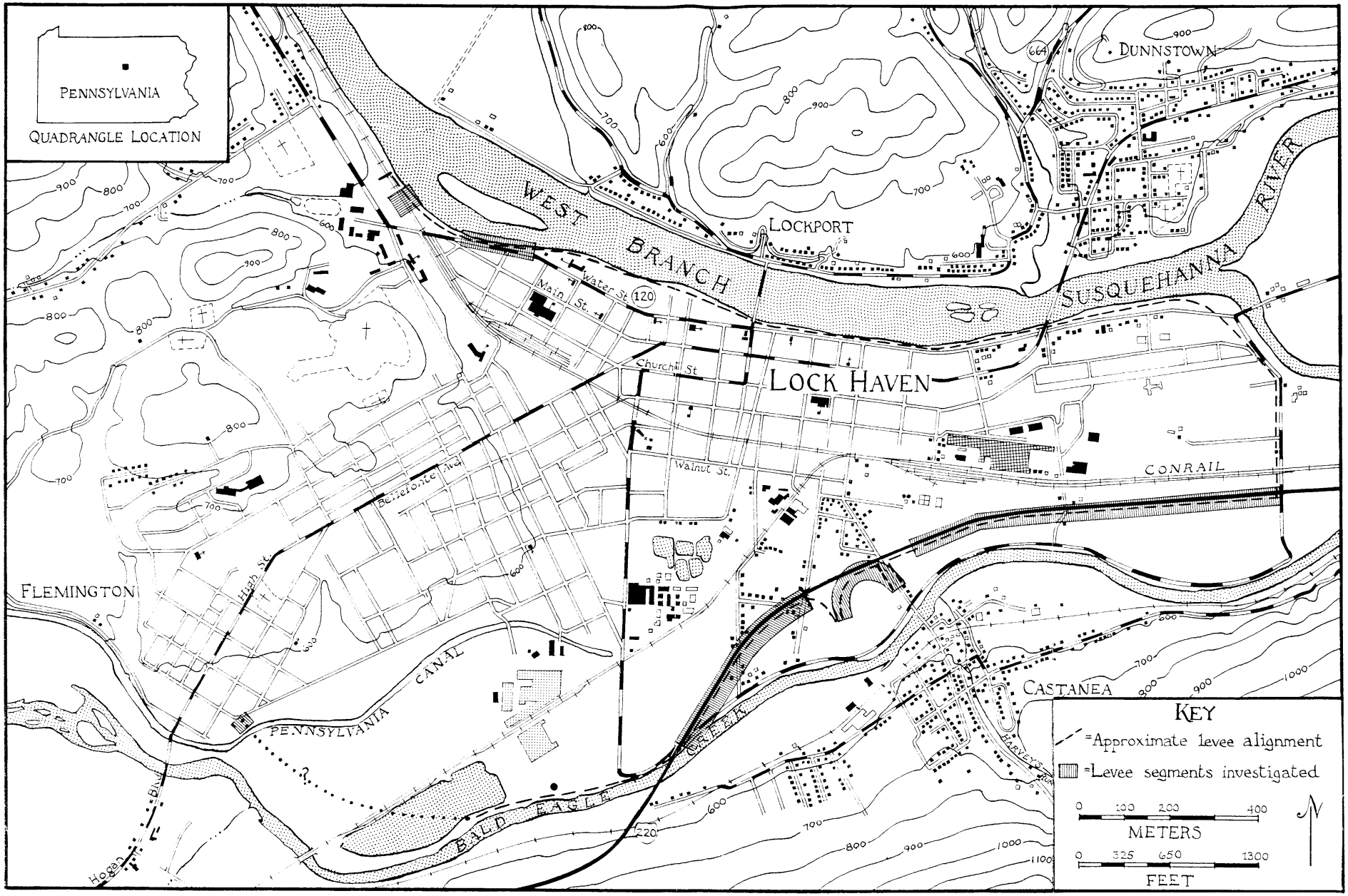

PENNSYLVANIA
QUADRANGLE LOCATION
LOCK HAVEN
Dunnstown
Lockport
Flemington
Mill Hall
Castanea
Draketown
Sunset Pines
SUSQUEHANNA
BRANCH
Great Island
C A S T A N E A
A L L I S O N
ALLISON
B A L D E A G L E
M O U N T A I N
BALD EAGLE STATE FOREST
LOCK HAVEN STATE COLLEGE
Piper Memorial Airport
Upper Castanea Reservoir
Airway Beacon
Drive-in Theater
Trailer Park
High Sch
PENN CENTRAL
PENNSYLVANIA CANAL
SCALE 1:24 000

Figure 2.2 Approximate Levee Alignment and Areas Investigated within the Lock Haven Flood Protection Project Area.


PENNSYLVANIA
QUADRANGLE LOCATION
WEST BRANCH
SUSQUEHANNA RIVER
LOCKPORT
DUNNSTOWN
LOCK HAVEN
FLEMINGTON
CASTANEA
CONRAIL
PENNSYLVANIA CANAL
BALD EAGLE CREEK
Water St
Main St
Churchill St
Walnut St
Bellefonte Ave
High St
Hogan Blvd
120
664
KEY
=Approximate levee alignment
=Levee segments investigated
0 100 200 400
METERS
0 325 650 1300
FEET

project area as a whole was considered to have a high probability of containing other, undiscovered archaeological sites. In response to these findings and to comply with the National Environmental Policy Act of 1969 (P.L. 91-190), the National Historic Preservation Act of 1966 (P.L. 89-665) and as amended (P.L. 96-515), and Executive Order 11593, the U.S. Army Corps of Engineers, Baltimore District undertook a Phase I archaeological survey of selected portions of the Lock Haven Flood Protection Project area as well as Phase II archaeological testing at a subset of the sites within it. These latter research efforts were conducted by Greiner Engineering Sciences, Inc. of Baltimore, Maryland under contract to the Baltimore District (Contract No. DACA 31-85-D-0032). In turn, Greiner Engineering Sciences, Inc. subcontracted with Archaeological and Historical Consultants, Inc. of Boalsburg, Pennsylvania to conduct the archaeological research in question.

The scope of the Phase I and Phase II archaeological research conducted by Greiner Engineering Sciences, Inc. and Archaeological and Historical Consultants, Inc. was defined in various scopes of work, supplements thereto, and letters (c.f., "Scope of Work, Phase I Prehistoric Cultural Inventory and Intensive Survey, Archaeological Investigations at Lock Haven, Clinton County, Pennsylvania" issued by the Baltimore District, U.S. Army Corps of Engineers; "Quality Control Plan for Lock Haven Phase I Prehistoric Cultural Inventory and Intensive Survey", submitted by Archaeological and Historical Consultants, Inc. on August 26, 1985 and revised September 5, 1985; "Supplement to Scope of Work and Quality Control Plan", memorandum to Mr. Phillip Grill, Greiner Engineering Sciences, Inc., from Mr. David Reese, U.S. Army, Baltimore District Corps of Engineers; and letter dated October 9, 1985 from Dr. Conran A. Hay of Archaeological and Historical Consultants, Inc. to Mr. Phillip Grill, Greiner Engineering Sciences, Inc.). As indicated in these documents, archaeological research at Lock Haven was to include both site survey and site testing. Survey was to occur at the Susquehanna upstream levee tie out, on the AM-PM Mini Mart property immediately to the east of the Lock Haven University parking lot, within the narrow strip of city park extending from Sixth Street to the intersection of Fourth and Water Streets, along the U.S. Route 220 embankment, and at the Bald Eagle Creek upstream tie out. Site testing was to occur at the Island View Site (36Cn166), Cummings Site 2 (36Cn169), and Crissmans Sites 2 (36Cn167) and 3 (36Cn168).

Both site survey and site testing were to occur in two stages. Stage I research was scheduled for the period between the middle of October and the middle of November 1985, and was to include site testing at the Island View Site and Cummings Site 2 as well as all survey work. Stage II research was to occur after the corn had been harvested from the large agricultural field along U.S. Route 220, and was to include any deep testing in this area as well as site testing at Crissmans Sites 2 and 3. This report describes the methods used and results obtained during these various research efforts.

3.0 BACKGROUND

3.1 Environment

3.1.1 Topography

The City of Lock Haven is located in northcentral Pennsylvania on a point of land formed by the confluence of the West Branch of the Susquehanna River and Bald Eagle Creek (Figure 2.1). These two rivers drain large portions of central Pennsylvania, and provide the major physiographic link between the Appalachian highlands of western Pennsylvania and the Piedmont of eastern Pennsylvania. Lock Haven is situated on level, low-lying, valley floor terrain bordered on both sides by wooded highlands. To the north and west are the foothills of the Allegheny Plateau--a landform which consists of irregularly dissected highlands, and which is found throughout much of western and northcentral Pennsylvania. To the south and east of the city lies the Ridge and Valley Province of southcentral, central, and northeastern Pennsylvania. This latter physiographic region is dominated by long, parallel, evenly spaced ridges separated by narrow valleys. The city of Lock Haven thus lies on the boundary between these two major physiographic provinces, and at the confluence of two of the most important drainages in central Pennsylvania.

3.1.2 Geology

The uplands surrounding Lock Haven consist primarily of geologically resistant sandstones, shales, and dolomites, while less resistant limestones, shales, and sandstones underlie the valley floor upon which the city is situated. In the vicinity of Lock Haven, upland geologic formations are numerous. Within the Ridge and Valley Province these formations are of Cambrian through Lower Devonian age; of particular interest to archaeologists are several formations containing chert and cherty limestones, including the Oriskany and Helderberg Formations which underlie lower valley slopes and the Mines Formation, which caps many ridges (Socolow 1960). The cherts in these formations may have served as sources of lithic raw material to the prehistoric inhabitants of the region.

Within the Allegheny Plateau region, geologic formations of Upper Devonian, Mississippian, and Pennsylvanian Age predominate. None of these formations contain chert or other potential sources of lithic raw material (Socolow 1960).

The bedrock in the Lock Haven vicinity is covered by surficial deposits of residuum, sideslope colluvium, and terrace alluvium. Four alluvial terraces of Wisconsin age are present on the valley slopes in the Lock Haven vicinity, and occur at elevations of 10', 20-25', 40' and 80' above stream base flow. The second of these terraces (20-25') is by far the most extensive, and in fact forms the bulk of the present valley floor. It consists primarily of sands, silts, and clays in varying proportions, and reaches a maximum thickness of approximately 50' above bedrock.

Residual and colluvial deposits are found on the tops and flanks of the uplands which surround Lock Haven, and consist primarily of angular sandstone and quartzitic debris derived from these upland areas.

Although the alluvial valley floor in the vicinity of Lock Haven is primarily of Wisconsin age, sedimentation and erosion has continued throughout the Holocene, and continues today. Episodes of sedimentation and erosion occur primarily during major floods, which have an average periodicity of one flood every seven years. As a result of these processes, the Wisconsin alluvium is covered by a thin veneer of more recent alluvium in some areas. Archaeological materials can be anticipated within these more recent deposits.

3.1.3 Climate

In the vicinity of Lock Haven, the Ridge and Valley Province and the Allegheny Plateau exhibit distinct climatological patterns. In general the plateau is wetter and cooler. It experiences 135-140 frost-free days per year, and receives 40-43" of rainfall annually. In contrast, the Ridge and Valley Province averages 150-160 frost-free days and 37-39" of rain each year (Bliss 1941). Both regions experience considerable local climatological variation, due primarily to elevational differences. Higher elevations receive approximately 9" more rainfall for each 1000' increase in elevation. Valleys tend to have greater daily temperature ranges due to lower minimums. Ridge and mountain tops experience less daily temperature variation.

3.1.4 Flora and Fauna

The Precolumbian flora of the area was probably dominated by six major forest types (Braun 1974). These included stream bank, ravine, valley floor, lower slope, upper slope, and ridge top forest associations. Stream bank forests were dominant along rivers and streams. The community was mixed-mesophytic, and was characterized by a hemlock-white pine association along smaller streams or a deciduous beech, basswood, sugar maple, tuliptree, ash, red maple, and red oak association along larger streams. Ravine communities were found on high elevation valley floors and in narrow valleys with a northern aspect. A mesophytic association consisting primarily of hemlock and white pine was present in such situations. Valley floor forests dominated the larger valleys, such as Nittany Valley and Penns Valley. White oak was the dominant species; chestnut, black oak, red oak, scarlet oak, white pine, and hickory were associated species. Lower valley slopes exhibited two associational variants. On north-facing slopes, a white oak-chestnut association including other oaks, sugar maples, ash, basswood, and red maple predominated. South-facing slopes exhibited a white pine-chestnut-hickory association. Upper slope forests were dominant on the steep, upper portions of ridges and on the escarpment of the Allegheny Front. Chestnut oak and chestnuts were most abundant, but sweet birch, black and scarlet oaks, and white and pitch pine were present as well. Ridge top forests were present on the flat tops of most of the mountains in the area, and consisted primarily of white pines, pitch pines,

chestnuts, and chestnut oaks.

Nuts were undoubtedly the single most important plant food resource provided by the predominantly deciduous forests of the region. Acorns, walnuts, chestnuts, and hickory nuts were available in abundance during the fall months, and provided a food resource high in caloric and nutrient value. In addition to providing annual nut harvests, these forests supported a wide variety of animal species. Of primary importance were white-tailed deer, black bear, wild turkey, eastern and New England cottontails, beaver, raccoon, elk, southern woodchuck, gray squirrel, ruffed grouse, and migratory water fowl (Doutt et al. 1973). The most important of these for the prehistoric inhabitants of the area were probably white-tailed deer, black bear, and wild turkey.

In Precolumbian times, deer were probably distributed throughout the region at densities of approximately 10-15 individuals per square mile. In the fall, this deer population congregated at sites which were heavy in mast (nut) production. During winter months, deer distribution was largely conditioned by the severity of the weather. During moderate winters, an even distribution over valley floors, hills, and ridge tops was maintained. Severe cold and snow, however, forced deer into sheltered coves and valleys. During the spring and summer months an even distribution was again maintained (Taylor 1956).

Wild turkey densities were probably on the order of 8-13 per square mile (Scheirer 1969). Ideal habitats were those containing mature oak forests with white oaks predominating--conditions found primarily on valley floors and lower slopes. Black bears were probably distributed at a density of approximately one non-cub bear per 5-15 forested square miles (Eveland 1973, Kordeck 1973). Beech, sugar maple, and birch constitute their principal food species supplemented by acorns, black cherries, and blueberries. Preferred ranges encompass steep terrain with ample understory. Thus, most bears were probably found on the higher elevations of the Ridge and Valley Province and the Appalachian Plateau.

3.2 Summary of Central Pennsylvania Prehistory

The prehistory of Pennsylvania is commonly divided into four major time periods: Paleo-Indian (11,500-9000 B.C.); Archaic (9000-1800 B.C.); Transitional (1800-1000 B.C.); and Woodland (1000 B.C.-1700 A.D.). These periods are all represented in the archaeological record of central Pennsylvania.

Climatic conditions in central Pennsylvania during Paleo-Indian times differed significantly from those that characterize the area today. Major continental glaciers covered large parts of northern North America, and produced a wetter and cooler climate in more southerly, non-glaciated regions such as central Pennsylvania. Associated with these different conditions, tundra vegetation dominated the local flora, while Pleistocene, cold-adapted animals such as the mastodon, bison, and caribou were dominant faunal elements. Like their contemporaries in other parts of North

America, Paleo-Indians in central Pennsylvania probably lived in hunting-gathering bands, and subsisted at least partially by hunting these large Pleistocene herd animals. They may also have collected small game and wild plant foods; however, most reconstructions of Paleo-Indian lifeways emphasize big-game hunting as the dominant economic activity.

To date, the only evidence of a Paleo-Indian occupation in central Pennsylvania consists of rare finds of the fluted-spear points that were made during this period. These are generally discovered as isolated finds at sites where materials from later periods are abundant. They probably represent short visits by Paleo-Indian bands or hunting parties.

At the close of the last major glacial episodes, Paleo-Indian cultures were replaced by Archaic ones. This change coincides with a climatic warming trend resulting in the replacement of the tundra vegetation by a spruce-pine-hemlock evergreen forest and finally by the oak-chestnut deciduous forest. These changes coincide with the replacement of the Pleistocene cold-adapted fauna by deer, elk, bear, turkey, and other deciduous forest species. The Archaic cultural pattern seems to represent the adaptive response of the human populations in the area to these climatic and ecologic changes. New projectile-point types and the addition of grinding equipment to the technological inventory suggest that new food sources--solitary forest animals and nuts and/or seeds in particular--were becoming important in the diets of Archaic peoples. Trapping and fishing were probably important subsistence activities as well. Since each of these activities was conducted during the most appropriate seasons and in the most favorable localities, considerable band mobility was required. It is likely that different camps were occupied during different times of the year and for different economic purposes. Base camps, hunting and butchering camps, and special-purpose camps such as nut-collecting stations may have been located in different areas, and occupied during the most appropriate seasons.

The Archaic Period is generally divided into Early (9000-5000 B.C.); Middle (5000-3600 B.C.); and Late (3000-1800 B.C.) subperiods. In general the Early and Middle Archaic Periods in central Pennsylvania are represented on multi-component sites primarily by relatively rare discoveries of projectile points probably used as darts thrown with the aid of an atlatl or throwing stick. These Early and Middle Archaic site components suggest a pattern of widely scattered, relatively small occupations. In contrast, Late Archaic sites are frequently large and dense, and Late Archaic points are relatively common on multi-component sites. In addition, food grinding equipment and ground-stone axes and adzes appear in Late Archaic contexts. These characteristics suggest larger populations and more intensive exploitation of local resources.

The Transitional Period is marked by the appearance of new projectile point styles, by the use of steatite cooking vessels, and by an increase in the importance of fishing equipment in artifact assemblages. In central Pennsylvania, the Transitional Period is also distinguished from the Archaic Period by the more exclusive use of a single lithic raw

material--rhyolite--for the manufacture of projectile points. This material is only available at several outcrops in southcentral Pennsylvania, where large accumulations of prehistoric quarry debris can be observed today. However, rhyolite points and debitage occur in Transitional Period sites throughout most of eastern and central Pennsylvania, indicating that the material was transported and traded over a wide region.

These features suggest that Transitional peoples had developed a new and distinctive adaptation to the environmental conditions of central Pennsylvania. An increase in the importance of riverine food resources and considerable mobility over long distances (probably by canoe) seem to have been important aspects of this new adaptive strategy.

At approximately 1000 B.C., the Transitional cultures of central Pennsylvania were gradually replaced by Woodland cultures, which are distinguished from earlier manifestations by the presence of ceramics and by new projectile point styles. These technological changes probably represent still further adaptive responses on the part of the human populations in the area. In this case, the response may reflect the first use of cultivated plants in the eastern United States. Although the evidence of cultigens is meager at Early Woodland sites in Pennsylvania, squash, beans, and perhaps polygonum, amaranth, and chenopods were being cultivated in the greater northeastern area by this time, and were probably present in central Pennsylvania as well.

The Woodland Period is subdivided into three phases--the Early Woodland (1000-500 B.C.), the Middle Woodland (500 B.C.-1000 A.D.), and the Late Woodland (1000 A.D. to historic contact at about 1700 A.D.). Although archaeological evidence concerning prehistoric lifeways during the first two of these phases is sparse in Pennsylvania, it is likely that the rudiments of agriculture were practiced and that people lived in small groups consisting of one or several families. Most Early and Middle Woodland sites are located near major rivers, and consist of a few small house foundations associated with sparse domestic refuse. In central Pennsylvania, archaeological remains from these periods consist primarily of scattered projectile points and pottery sherds on the surfaces of multi-component sites (Turnbaugh 1977). Only at Sheep Rock Shelter in Huntington County (Michels and Smith 1967) and at a village site (36Ly37) (Turnbaugh 1977) in Lycoming County have Early and Middle Woodland materials been excavated. It has been noted, however, that the West Branch of the Susquehanna River was probably the most important gateway between eastern Pennsylvania and the more vibrant Early and Middle Woodland cultures to the west (Kent et al. 1971).

In contrast with the Early and Middle Woodland, the Late Woodland phase has been extensively investigated throughout eastern Pennsylvania, and to a lesser extent in central Pennsylvania. As a result, a fairly detailed picture of life during Late Woodland times has emerged. At the beginning of this phase, most of the Susquehanna River drainage was occupied by people with a culture known as Clemson Island. This culture is

distinguished by grit-tempered pottery and by broad-based, triangular projectile points. The Clemson Island people lived in small villages of several households, and built small, oval or sub-rectangular huts. Keyhole structures, interpreted as the remains of sweat baths, are also found on sites from this period. Clemson Island people practiced agriculture, and supplemented their diets by hunting, fishing, and wild plant-food collecting (Hatch 1980, Hay and Hamilton 1984).

Clemson Island sites in central Pennsylvania include the Nash Site (36Cn17; Smith 1972, 1976), the Ramm Site (36Cn44; Smith 1972, 1976), the Miller Site (36Cn97; Smith 1972, 1976), the Mill Hall Site (36Cn101;Hay and Hamilton 1984), and the Brock Mound and Village Site (36Cn1; Turnbaugh 1977). These sites reveal the initial stages of increasing complexity in Late Woodland cultures, a trend that was to continue throughout the remainder of the period.

At an unknown date sometime during the Late Woodland, Clemson Island people were replaced by a new and ceramically distinctive culture known as Shenks Ferry. Like their Clemson Island predecessors, the Shenks Ferry people practiced agriculture, lived in small villages consisting of small oval huts, and made both grit-tempered pottery and triangular projectile points. Archaeologically, they are distinguished from Clemson Island largely on the basis of differences in the decorative motifs of their pottery. These differences are limited to rim treatment where incising replaces punctation. Cord-marking and crushed-quartz or chert temper are a common characteristic of the ceramics of both phases.

The most important Shenks Ferry site reported to date in central Pennsylvania is the Bull Run Site (36Ly119; Bressler 1978). This site, a large stockaded village, indicated defensive concerns on the part of its inhabitants, presumably reflecting to increased populations and subsequent competition for important resources. The need for defensive works and large nucleated settlements are factors which played important roles in the following period.

The Shenks Ferry culture was in turn replaced by the Susquehannock Indians--an historically known tribe that entered central Pennsylvania during the sixteenth century. Susquehannock sites usually consist of large, stockaded villages located near major rivers. Their pottery is shell-tempered, often with high collars or castellations and geometric multi-lineal incising. The Susquehannocks made small, narrow, triangular projectile points.

The Quiggle Site (36Cn6; Smith 1976) is an example of a large, stockaded, nucleated Susquehannock village site in central Pennsylvania. Dated between 1500-1550 A.D., this site displayed several episodes of stockade and structure construction. As indicated by the Fisher Farm Site (36Ce36; Hatch 1980), the Susquehannocks occupied small special-purpose sites as well. However, it is the aggregation of major portions of the population in a few large stockaded villages which increasingly characterized the end of the Late Woodland Period.

The prehistory of central Pennsylvania closes with the first Indian-European contacts. Relations between the two groups took various forms, usually beginning as trade interactions and proceeding ultimately to armed conflict and displacement of the Indian populations. At the time of the first European penetration into the central part of Pennsylvania, the Susquehannocks were the dominant Indian group in the region. They probably had entered the area about 1500, moving southward into the Susquehanna Valley to gain access to the fur trade with the Dutch on Delaware Bay. They remained the dominant group in the area until 1675, when their culture was finally shattered by the newly-introduced diseases brought by European settlers, by constant warfare with their Iroquoian neighbors to the north, and by incursions of Europeans moving up the Susquehanna River from Maryland. During their 100 years in the central Pennsylvania area, the Susquehannocks operated as intermediaries in the flow of European goods from east to west, and many such goods are encountered in the archaeological record that they left behind.

With the collapse of the Susquehannocks, central Pennsylvania became a refuge area for other displaced Indian groups. The first of these were the Delaware, who entered the area in the 1680s. They were followed by the Shawnee in the 1690s and by the Naticoke and the Conoy in the early 1700s. As the 1700s progressed, European settlement in central Pennsylvania began, and gradually displaced the Indian populations, which were forced to move further to the north and west as the frontier advanced.

3.3 History of Lock Haven

The first Euro-American to settle within the area now encompassed by the City of Lock Haven is reputed to have been a squatter named Clarey Campbell, who cleared land and built a log cabin there in 1769. However, ownership of the point of land between the West Branch and Bald Eagle Creek first passed to Dr. Frances Allison, who applied to the Penns for a patent in 1769 and received it in 1772. Dr. Allison never took up residence on the parcel, but instead sold his patent to John Fleming, who moved to the site and built a small farm in 1773. John Fleming remained on his new farm until his death in 1777, at which time his land was subdivided and passed to several heirs, some of whom moved to the site and took up residence on their various parcels. These early residents of Lock Haven consisted primarily of three families--the Flemings, the McCormicks, and the Reeds. These families established small, scattered farms within the tract of Dr. Allison's original patent (Maynard 1875, Linn 1883).

Settlement within and near Lock Haven was interrupted during the American Revolution, when hostile Indians allied with the British began a campaign of raids on the Pennsylvania frontier settlements. These raids culminated in the "Big Runaway" of 1778, when all the settlements within the West Branch Valley were abandoned, and their inhabitants fled down river to Fort Augusta, at what is now Sunbury. The site of Lock Haven remained uninhabited throughout the Revolution, and was occupied again only after the restoration of peace in 1783. At this time, the original

inhabitants returned to their farms. During the remainder of the eighteenth century, additional land subdivisions occurred, and new families moved to the site, cleared land, and established small farms (Maynard 1875, Linn 1883).

By the turn of the eighteenth century, approximately a dozen cleared plots consisting of a few acres each interrupted the forests that then covered the point of land on which Lock Haven now stands. In addition, the nucleus of a town was present in the form of a schoolhouse, a church, and two taverns, all built of logs. The little settlement was at that time known as Old Town, and it continued to grow during the first 25 years of the nineteenth century, primarily through the establishment of new farms and the clearing of additional land.

Although Old Town constituted the nucleus of a town, Lock Haven itself was not laid out until 1834, after construction of the West Branch Division of the Pennsylvania Canal was well underway. Situated at the confluence of Bald Eagle Creek and the West Branch and containing a major lock for the canal and a raft haven in the river, the site was clearly a major node in the future transportation networks of the Pennsylvania. These advantages were recognized by the land speculator Jerry Church, who in 1834 purchased much of what is now Lock Haven east of Jay Street, and laid out 200 town lots. These were sold at auction in the same year, and the town of Lock Haven came into existence (Maynard 1875, Linn 1883).

Because of its strategic location vis-a-vis canal and river, Lock Haven grew rapidly. Most development occurred along Water Street, which was the main thoroughfare leading through the town. By 1838, seven residences, three office buildings, two stores, a hotel, and a blacksmith shop were present along Water Street, while three to four additional structures stood along Main Street (Maynard 1875). The town was incorporated in 1840, and in 1844 became the county seat of the newly formed Clinton County (Maynard 1875, Linn 1883).

In the middle of the nineteenth century, Lock Haven began to grow rapidly as a result of the lumber boom that engulfed northcentral Pennsylvania at that time. Focusing first on white pine and subsequently on hemlock, lumbering of the virgin north Pennsylvania forests became the premier industry of the region. Every spring, enormous numbers of logs and rafts of sawn lumber were transported down the rivers of the area to mills or directly to markets. Because of its strategic location vis-a-vis transportation networks, Lock Haven became an important node in the lumbering industry of the region. In 1849, the West Branch Log Boom was built, allowing for the storage of logs coming down the West Branch. New sawmills were built within and near the town, and Lock Haven's principal source of employment and wealth became the booming lumber industry.

> . . . From this period the rapid growth of Lock Haven commenced. Property doubled, trebled, and quadrupled in value, and soon the

> fields around the town were dotted with houses, and the streets filled with an industrious, energetic and prosperous population (Maynard 1875:56).

In response to this growth, various parcels of land were added to the town, beginning in 1840 and culminating in 1870, when Lock Haven became incorporated as a city. The first bridge to Lockport was built in 1852, and in 1859, the Sunbury and Erie Railroad was completed, and included a stop at Lock Haven.

The height of the lumber boom came late in the nineteenth century. By 1875, numerous sawmills were in operation in and around Lock Haven, with an aggregate cutting capacity of 100,000,000 board feet/year (Maynard 1875). Nine mills were operating within city limits, as were several related industries, including two tanneries (which relied on hemlock bark--a by-product of lumbering) and three planing mills. Also present were several ironworks and approximately 200 smaller businesses and manufacturing enterprises (Maynard 1875).

By the turn of the century, the white pines and hemlocks of northcentral Pennsylvania were lumbered out, and the lumbering industry fell on hard times. The impact to Lock Haven was apparent as early as 1896, when several sawmills lay vacant and log ponds were dry. However, the economic base of the community was still lumbering or at least lumber-related, as evidenced by at least one sawmill, several planing mills, several tanneries, two furniture companies, and a wagon shop. With the reduction in the importance of lumbering, new enterprises had been started, most notably a fire brick company and a clay works. The ironworks in continued operation (Sanborn-Perris Map Co., Ltd 1896).

During the early twentieth century, the economic trend away from lumbering continued. While several planing mills and tanneries continued operating, all of Lock Haven's sawmills were idle by 1925. In their place were two refractories (fire brick companies) and two major silk mills. Of particular significance for the future were two companies--American Aniline Products, Inc., with two plants in operation, and the New York and Pennsylvania Company paper mills, located where the Hammermill Plant now stands. A number of smaller industries were present as well (Sanborn Map Co. 1925).

As the twentieth century progressed, Lock Haven held its own as a small industrial city. Without the stimulus of the lumbering industry, growth was slow to absent. The city was hit hard by the depression, and experienced extremely high unemployment. Economic viability returned with the war years, but today Lock Haven exhibits below-average per capita income and above-average unemployment.

3.4 Preservation Management Background

The research described in this report was preceded by an earlier, reconnaissance level archaeological survey conducted by The Pennsylvania

State University in 1978. This latter research effort involved background research concerning the topography, geology, and ecology of the Lock Haven area, historical research, a collector interview survey, and a reconnaissance field survey. During background research and collector interviews, a total of 30 previously discovered prehistoric archaeological sites were identified in the Lock Haven vicinity. Of these, two were in close proximity to the Lock Haven Flood Protection Project area. During the reconnaissance field survey, the two sites (36Cn46 and 36Cn46a) in the vicinity of the project area were investigated to determine site boundaries and to assess internal site structure. In addition, a sample of land surfaces within or near the project area was examined for previously undiscovered sites.

As a result of the reconnaissance field survey, eight prehistoric archaeological sites were identified and assessed. These sites were termed the Island View Site (36Cn166), the Water Street Site (36Cn175), the Memorial Park Site (36Cn164), Crissmans Sites 1-3 (36Cn46, 36Cn167, and 36Cn168), and Cummings Sites 1-2 (36Cn176 and 36Cn169). Of these sites, all but Crissmans Site 1 (36Cn46) and Cummings Site 1 (36Cn176) were within the Lock Haven Flood Protection Project area.

3.4.1 Island View Site (36Cn166)

During the 1978 reconnaissance survey, the Island View Site was discovered within Island View Park--a small, grass-covered park located in the northwestern portion of Lock Haven near the intersection of Water and West Church Streets. At the time of discovery, the site was situated on level floodplain or terrace terrain at an elevation of approximately 18-19' above the West Branch of the Susquehanna River. Immediately to the north, the land sloped steeply downwards to sand spits along the edge of the West Branch.

At the time of discovery, the Island View Site was identified as a small remnant of a once larger site that extended beyond the margins of the park into areas now covered by tennis courts, parking lots, railroads, and city streets. Local informants reported that extensive remains, including burials, had been exposed during construction of the Lock Haven University parking lot immediately to the southeast of Island View park (Hay et al. 1978). Presumably, these remains represented a portion of the Island View Site to the southeast of the existing site remnant in the park. Whether any portions of the Island View Site remained intact under the parking lot or in any other developed area surrounding the park was not known.

During the reconnaissance level investigations conducted in 1978, two auger probes and one test pit were excavated within the Island View Site. Based on these tests, the site was tentatively identified as a deeply stratified, multi-component site with Late Woodland, Transitional, and Archaic components. Whether these components were mixed or within undisturbed stratigraphic contexts was not determined (Hay et al. 1978).

At an undetermined date between 1978 and 1985, a boating access ramp was constructed in the Island View Park. This activity involved cutting a ramp through the steep bank that constituted the northern (riverside) boundary of the Island View Site. As a result, approximately 30-50% of that portion of the site lying within the park was destroyed.

3.4.2 The Water Street Site (36Cn175)

During the 1978 survey, four test probes were excavated in residential yards between Water Street and the Susquehanna River. Deep fill was encountered in all of these probes; however, two of the four probes also revealed undisturbed alluvium beneath the fill. In one of these latter two probes, two flakes were recovered from the alluvium, indicating that a buried site might be present. The probe in question was located in a yard near the intersection of Water Street and First Street, and was termed the Water Street Site.

3.4.3 The Memorial Park Site (36Cn164)

The Memorial Park Site was discovered during the 1978 survey on the southern bank of the Susquehanna River opposite the westernmost point of Great Island. The site extended into Memorial Park on the north side of Water Street and into the Piper airport on the south side of Water Street. In this area, the terrain consisted of level, grass-covered floodplain along the West Branch of the Susquehanna River.

During the 1978 reconnaissance, two test pits and five test probes were completed within the Memorial Park Site. These excavations produced large numbers of chipped stone and grit-tempered ceramic artifacts from stratified alluvial deposits. In addition, a postmold was discovered at the base of one of the test pits. These results indicated that the Memorial Park Site was a multi-component, deeply stratified site. The uppermost component was identified as representing a Clemsons Island occupation. At least one and perhaps several earlier components were present in levels below the Clemson Island zone.

In 1982, additional testing was conducted at the Memorial Park site, primarily to more fully identify site boundaries. Subsequently, this site was nominated to and accepted on the National Register of Historic Places (Hay and Stevenson 1982).

3.4.4 Crissmans Site 1 (36Cn46 and 36Cn46a)

Crissmans Site 1 was identified originally in the Pennsylvania Archaeological Site Survey (PASS) files as two separate sites (36Cn46 and 36Cn46a) located in the large cultivated field to the south of U.S. Route 220 on the southeastern outskirts of Lock Haven. During the 1978 reconnaissance, pedestrian surface survey indicated that the two sites in question were actually part of a single large lithic scatter extending from the bank of Bald Eagle Creek throughout a large portion of the eastern half of the above-mentioned field. The site encompassed level to gently

undulating terrain on the Bald Eagle Creek floodplain. The artifacts recovered indicated that several components, including Transitional and Late Woodland, were present. Two test probes were excavated within the site, and produced two rhyolite flakes from a subsoil zone underlying a disturbed plow zone. These latter results suggested that buried and undisturbed remains might be present.

3.4.5 Crissmans Sites 2 and 3 (36Cn167 and 36Cn168)

Crissmans Sites 2 and 3 were discovered during the 1978 reconnaissance survey. Like Crissmans Site 1, they were found during pedestrian surface survey within the large cultivated field to the south of U.S. Route 220. At the time of discovery, 23 chipped stone artifacts, including flakes, shatter, and preforms, were recovered from Crissmans Site 2, while Crissmans Site 3 produced only two flakes. Both sites were identified as sparse lithic scatters.

3.4.6 Cummings Site 1 (36Cn176)

During the 1978 reconnaissance, Cummings Site 1 was discovered during pedestrian surface survey of a small cultivated field to the south of U.S. Route 220 and immediately to the west of the Jay Street connector. The survey produced 83 artifacts, including flakes, shatter, preforms, and a single grit-tempered potsherd. In addition, a test probe was excavated within site boundaries, and produced a single flake from an undisturbed subsoil underlying the plow zone. These results were interpreted as indicating that Cummings Site 1 probably contained several components mixed within plow zone contexts, but might also contain more deeply buried materials within undisturbed soils.

3.4.7 Cummings Site 2 (36Cn169)

Cummings Site 2 was also discovered in the small cultivated field to the west of the Jay Street connector. The surface survey produced 61 lithic artifacts, including a Middle Archaic projectile point, from within site boundaries. In addition, a 1 m x 1 m test pit was excavated at the site, and produced 20 additional lithic artifacts, but no diagnostic materials. A possible prehistoric feature, consisting of a concentration of charcoal at the plow zone/subsoil interface, was identified. Based on these findings, the site was interpreted as a multi-component plow zone site at which features might be preserved.

4.0 SOILS RESEARCH

4.1 Introduction

The Lock Haven Prehistoric Cultural Resources Inventory and Intensive Survey began with soils research concerning the project area. The purpose of the soils research was to provide an overview of the geomorphological processes that created the existing land surfaces of the project area and to identify areas where stratified or buried cultural resources might exist. To these ends, background soils research and a detailed soils survey were conducted. Background research focused on the entirety of the project area, while the detailed soils survey focused on the U.S. Route 220 corridor, which constituted the portion of the project area considered most likely to contain buried remains.

4.2 Background Research

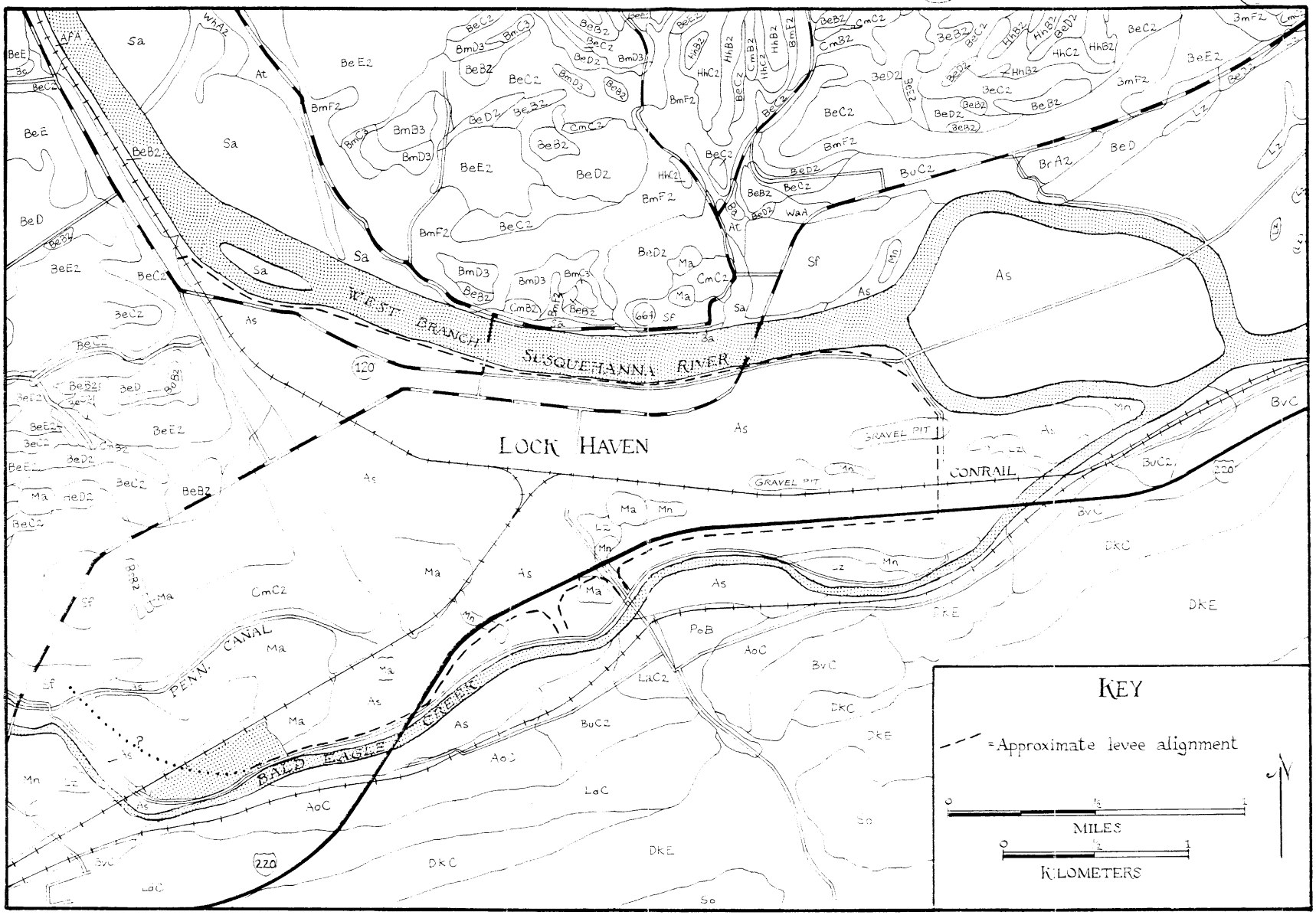
A variety of soils have formed in the alluvial, colluvial, and residual parent materials of the Lock Haven area. For most of its extent, the proposed flood protection system lies within areas mapped as Ashton silt loam--a deep, well-drained, level to gently sloping soil found on stream terraces (Figure 4.1). Ashton soils formed in alluvium, but are rarely flooded today. The terraces on which Ashton soils are found can thus be assumed to predate the existing floodplains of the area, and may frequently be of Pleistocene or early Holocene age. Ashton soils have well developed, dark yellowish-brown to reddish-brown subsoils that are more distinct than those of the typical floodplain soils of the region (e.g., Huntington silt loam, Lindside silt loam). This characteristic is attributable to their greater age.

The only portions of the levee system not on Ashton soils include the Susquehanna River and Bald Eagle Creek upstream tie outs as well as several small areas along the U.S. Route 220 embankment. At the Susquehanna River upstream tie-out the flood levee will lie within an area mapped as Berks Channery silt loam--a well-drained, moderately sloping upland soil with many channery fragments. Along the U.S. Route 220 embankment, the levee alignment crosses several small areas mapped as Melvin and Newark silt loams--both of which are level, poorly drained floodplain soils. The Bald Eagle Creek upstream tie-out is mapped as Sequatchie fine sandy loam (high), a high terrace soil (Figure 4.1; USDA 1966).

A variety of other soils occur in the immediate vicinity of the Lock Haven flood protection project area. While the valley floor is generally covered by Ashton and Lindside soils, uplands within the Ridge and Valley Province near Lock Haven are covered primarily by Andover, Laidig, and DeKalb soils (Figure 4.1). These soils are level to steeply sloping, shallow to deep, well drained to poorly drained soils that form in colluvium or residuum. Primarily because of differences in parent materials, other soils are found on uplands within the Allegheny Plateau topograhic province. Prominent soils in this latter area include Buchanon, Brinkerton, Berks, Comly, Hartleton, and Andover (Figure 4.1). These soils

Figure 4.1. Soils of the Lock Haven Vicinity (from USDA 1966).

AoC	Andover very stoney loam, 8-25% slopes
As	Ashton silt loam
At	Atkins silt loam
Ba	Barbour fine sandy loam
Bc	Basher silt loam
BeB2	Berks channery silt loam, 3-8% slopes
BeC2	Berks channery silt loam, 8-15% slopes
BeD	Berks channery silt loam, 15-25% slopes
BeE	Berks channery silt loam, 25-35% slopes
BeD2	Berks channery silt loam, 15-25% slopes, moderately eroded
BeE2	Berks channery silt loam, 25-35% slopes, moderately eroded
BeC3	Berks channery silt loam, 8-15% slopes, severly eroded
BmD3	Berks-Montevallo channery silt loam, 15-35% slopes, severly eroded
BmF2	Berks-Montevallo channery silt loam, 35-100% slopes, moderately eroded
BuC2	Buchanan gravelly loam, 8-15% slopes, moderately eroded
BvC	Buchanan very stoney loam, 8-25% slopes
CmB2	Comly silt loam, 3-8% slopes, moderately eroded
CmC2	Comly silt loam, 8-15% slopes, moderately eroded
DkC	DeKalb very stoney soils, 8-25% slopes
DkE	DeKalb very stoney soils, 25-100% slopes
HeD2	Hagerstown silt loam, 15-25% slopes, moderately eroded
HhB2	Hartleton channery silt loam, 3-8% slopes, moderately eroded
HhC2	Hartleton channery silt loam, 8-15% slopes, moderately eroded
LaC	Laidig very stoney loam, 8-25% slopes
LaC2	Laidig gravelly loam, 8-15% slopes, moderately eroded
Lz	Lindside silt loam
Ma	Made land
Mn	Melvin and Newark silt loams
PoB	Pope loams, fans, 3-8% slopes
Sa	Sequatchie loam
Sf	Sequatchie fine sandy loam (high)
So	Stoney land
WhA2	Whitewell silt loam, 0-5% slopes, moderately eroded


LOCK HAVEN
WEST BRANCH SUSQUEHANNA RIVER
PENN. CANAL
BALD EAGLE CREEK
CONRAIL
GRAVEL PIT
GRAVEL PIT
120
220
220
KEY
= Approximate levee alignment
0 ½ 1
MILES
0 ½ 1
KILOMETERS

are level to steep, poorly drained to moderately well drained, and formed in both colluvium and residuum (USDA 1966).

4.3 Soil Survey Methods

During the detailed soils survey, augur probes (3" bucket) were placed at 30 m (98') intervals along the entire U.S. Route 220 corridor, from the Route T-375 underpass to Bald Eagle Creek. These probes were excavated and evaluated by the project soils scientist, and were designed to determine whether buried soil horizons or stratified Holocene alluvium existed within any portions of the U.S. Route 220 corridor. Every probe was extended through the A- or Ap-soil horizon into the underlying B-horizon, and every third probe was extended to "refusal" or to the maximum depth of the augur (approximately 2 m or 7'). For each probe, the depth, texture, and color of each soil zone was recorded. The resulting data were then used to generate a geomorphological/sedimentological interpretation of the U.S. Route 220 corridor area.

4.4 Soil Survey Results

In general, the results of the detailed soils survey were consistent with background research. The soils along the U.S. Route 220 embankment were found to be relatively old, having formed in fluvial terraces of Wisconsin age. Despite the fact that it is occassionally flooded, the existing land surface along the U.S. Route 220 embankment is erosional in contrast to a surface receiving additional material through flooding. This interpretation was consistent with the identification of the soils in question as Ashton silt loams, which are relatively old stream terrace soils.

The soil profiles revealed by the deep auger tests generally consisted of Ap-horizons extending to depths of 25-50 cm (10"-20") overlying well developed Bt-horizons. At depths of approximately 100 cm (39"), the Bt-horizons graded into BC horizons, which in some tests extended below the maximum depth of testing. In other tests, C-horizon materials were encountered at the base of the horizon. Frequently, cobble deposits were hit at depths of 100-180 cm (39"-70"; see below, Section 12.1).

Three small areas encountered along the U.S. Route 220 embankment constituted exceptions to the above generalizations. Two of these were encountered at the margins of two drainageways, one located approximately midway between the Route T-375 underpass and the Castanea Township Fire Company property, the other located approximately 250 m (820') to the east of the Fire Company property. In both cases, slightly deeper (50-80 cm or 20-32") Ap-horizons and A-horizons overlay well developed B-horizons equivalent to those observed elsewhere on the Wisconsin terrace. The thick A-horizons were interpreted as representing minor soil accumulation along the drainageways during post-Wisconsin and probably recent times. In view of the minimal depth of these A-horizons below the plow zone (15-50 cm or 6-20") and the inferred age of deposits, the probability that they contained buried archaeological remains not visible on the surface was

negligible.

A third area of more recent deposition was also encountered, located on a slightly lower area of floodplain near Bald Eagle Creek. In this area, deposits of probable Holocene origin extended to depths in excess of 165 cm (65"), indicating that buried archaeological materials might be present.

In summary, the results of soils research indicated that for most of its length, the U.S. Route 220 corridor lay on an erosional surface of Wisconsin age. Presumably, this surface was formed by deposition of fine-textured glacial outwash--a process that ceased at the end of the Pleistocene. With the exception of two minor drainageways with deeper A-horizon soils, the only other geomorphological feature crossed by the U.S. Route 220 corridor was a narrow strip of Bald Eagle Creek floodplain at its western terminus. Here, deep alluvium of probable Holocene age was encountered. Collectively, these results indicated that within the U.S. Route 220 corridor, buried or stratified cultural remains could be expected to occur only at its western terminus at Bald Eagle Creek.

5.0 METHODS

5.1 Field Methods

Field Research within the Lock Haven Flood Protection Project area was preceded by background research concerning the topography, geology, ecology, prehistory, and history of the Lock Haven region (see above, Section 3.0). In addition, historic maps were consulted to identify all potential historic sites within the project area. For this purpose, the available documents at the Clinton County Courthouse, the Clinton County Historical Society, the Lock Haven Public Library, and Pattee Library at The Pennsylvania State University were examined. In general, the results of this historic documents search were negative. At the Clinton County Courthouse, plat maps dating back to approximately 1900 were examined; however, these maps showed property boundaries only, and did not provide data concerning structure locations. At the Pattee Library, Sanborn Map Co. insurance maps from 1885 to 1925 provided extensive evidence of structure locations in Lock Haven, but did not cover the areas included in the present project.

At the completion of background research, field research began, and involved a variety of techniques, including pedestrian surface survey, shovel test excavation, auger probing, detailed soils survey, and test pit excavation. As appropriate, these techniques were used to locate both buried and surface archaeological sites and to evaluate sites for inclusion on the National Register of Historic Places.

Pedestrian surface survey was conducted only within the large cultivated field lying to the south of U.S. Route 220 between the Route T-375 underpass and the Castanea Township Fire Company (Figure 2.2). Within this field, survey procedures involved walking four to six transects paralleling the Pennsylvania Department of Transportation fence at the edge of the U.S. Route 220 embankment. Transects were approximately 2 m (7') apart; survey coverage of a strip approximately 10 m to 12 m (33' to 39') wide adjacent to the Pennsylvania Department of Transportation fence was thus achieved. During pedestrian survey, each artifact visible on the ground surface was marked with a surveyor's flag and then point-provenienced using the Pennsylvania Department of Transportation fence as a measured baseline. After point proveniencing, each artifact was collected and bagged by its provenience.

After completion, the "find spots" of all artifacts discovered during the survey were plotted on maps. The resulting data were then used to identify spatial artifact clusters, or sites.

In areas where the ground surface was obscured by vegetation, shovel tests were excavated to locate surface sites. Such areas included the strip of parkland paralleling Water Street between Sixth and Fourth Streets, the U.S. Route 220 corridor between Hanna Street and the Bald Eagle Creek, and the Bald Eagle Creek upstream tie out (Figure 2.2).

The shovel tests excavated in these areas were placed at 15 m (49') intervals, measured approximately 60 cm (24") in diameter, and in areas of undisturbed soils, were extended to the base of the A- or Ap-soil horizon. In disturbed areas, shovel tests were excavated to varying depths in attempts to penetrate fill or dump deposits, and to locate buried undisturbed land surfaces beneath. All soil (with the exception of some dump and fill deposits) from shovel tests was screened (1/4" mesh) to recover artifacts, which were bagged by shovel test.

At selected points within the project area, deep auger probes were excavated to assess the depth of deposits, to locate buried land surfaces, and to determine degree of soil development. Such probes were placed within the Island View Site (36Cn166) and within the shovel tests along Water Street. The soil from each probe was screened to recover artifacts, and the texture and color of each soil zone encountered were recorded.

To assess the significance of selected archaeological sites within the Lock Haven Flood Protection Project Area, varying numbers of 2 m x 2 m (6.5' x 6.5') test pits were completed within site boundaries. With the exception of Ap- (plow zone) soil horizons, which were removed as single provenience units, test pit excavations proceeded by arbitrary 10 cm (4") or 5 cm (2") levels within natural soil strata. Distinguishable natural soil levels were termed zones, and were assigned roman numerals beginning with the uppermost level. Arbitrary levels within zones were assigned arabic numbers, beginning with the uppermost level within a given zone. Thus, three arbitrary 10 cm (4") levels within a natural soil stratum might have been termed Zone II Level 1, Zone II Level 2, and Zone II Level 3. All earth removed from levels was screened (1/4" mesh) and artifacts were recovered and bagged by zone and level. Any features encountered during excavation were sectioned and excavated as separate provenience units. Features were drawn and photographed in plan and in profile, and when appropriate, samples of feature fill were retained for laboratory testing and flotation processing. At the completion of excavation, test pit profiles were drawn and photographed.

During all field investigations, standard archaeological recording techniques were used. A daily field log of activities was maintained, and field crews recorded pertinent excavation data on level/stratum, feature, shovel test, and auger probe forms. Within sites, vertical and horizontal proveniences were recorded from arbitrary datum points. All field investigations were recorded on detailed (1"=100') mapping provided by the Baltimore District, Army Corps of Engineers.

At the completion of fieldwork, all artifacts, samples, notes, drawings, and photographs were returned to the laboratory at Archaeological and Historical Consultants, Inc. for analysis, where they presently remain in temporary curation. Long term curatorial arrangements have not been made as of this writing.

5.2 Laboratory Methods

At the completion of fieldwork, all artifacts, notes, drawings, photographs, etc. were analyzed to provide chronological and functional interpretations of the archaeological resources that had been discovered within the Lock Haven Flood Protection Project area.

To address these issues, several basic analytical techniques were employed. Projectile points were assigned to chronologically sensitive types and/or periods of use; lithic artifacts were identified as to raw material and function; prehistoric ceramic artifacts were analysed for temper type, surface treatment, and decorative motif; and historic artifacts were identified by material, function, and when appropriate, style.

For the purposes of projectile point typology, standard references were consulted. Key sources included Ritchie (1971), Broyles (1971), and Coe (1964). Additional references included Bebrich (1971), and Funk (1976). Using these references, the projectile points recovered during the present project were compared to photographs and drawings of typed and dated pieces, and typological assignments were made accordingly.

All lithic artifacts recovered during the project were assigned to one of seven raw material types, including jasper, flint, chert, rhyolite, quartz, quartzite, and other raw materials. In addition, lithic artifacts were classified by function, using 12 basic functional types. These latter types included projectile points, drills, side scrapers, end scrapers, other tools, preforms, primary trimming flakes, biface thinning flakes, cores, shatter, ground stone artifacts, and fire-cracked rock. For prehistoric ceramic artifacts, three basic temper types were identified, including crushed chert, crushed quartz, and sand. Surface treatment generally consisted of cord-marking or smoothing. Decorative motifs included incising only.

Historic artifacts were first separated by general material of manufacture into metal artifacts, ceramic artifacts, glass and other (e.g., shell or plastic) artifacts. Metal items were identified as nails or other metal items; nails were further identified as wrought, cut, or wire while other metal items were described. In general, however, the identification of nails and other ferrous-based artifacts was curtailed by rust. For nails, only the identification of square versus wire nails was possible. Historic ceramics were identified by ware type and decorative treatment. Wares included brick, redware, stoneware, porcelain, semi-porcelain, pearlware, ironstone, and ball clay, while decorative treatments included cream-colored (CC), sponged, edged, hand-painted, transfer printed, flow blue, mocha, and salt glaze. Glass artifacts were identified (when feasible) as pre- or post-1900 in date of manufacture, and as bottle glass, jar glass, or glassware. In addition, a variety of glass colors were recorded, including clear, "green" (i.e., green, amber, and brown), white, amythest, and black.

After identification, the numbers of artifacts of each type were tabulated by level and excavation unit. The results were then compared between levels, units, and sites to address key research issues.

6.0 RESULTS

6.1 Field Results

6.1.1 Introduction

As indicated above (see Section 2.0), archaeological field research during the present project was to occur within seven segments of the Lock Haven Flood Protection Project levee system. These included 1) the Susquehanna River upstream tie-out, 2) Island View Park, 3) the area between Lock Haven University paring lot and the intersection of Sixth and Water Streets, 4) the area within a narrow strip of municipal park along Water Street between Sixth and Fourth Streets, 5) the area along the U.S. Route 220 embankment from the T-375 underpass to Hanna Street, 6) the area along the U.S. Route 220 embankment from Hanna Street to the Bald Eagle Creek, and 7) the Bald Eagle Creek upstream tie-out.

During the course of fieldwork within the above-listed levee segments, ten archaeological sites were discovered and/or relocated and further investigated (Figure 6.1). These sites included four that had been found during the previous archaeological reconnaissance of the project area (Hay et al. 1978). These sites were the Island View Site (36Cn166), Crissmans Sites 2 and 3 (36Cn167 and 36Cn168), and Cummings Site 2 (36Cn169). The remainder of the sites found during the reconnaissance survey were outside the project area or were within portions of the project area not covered by this study (see above, Section 3.4).

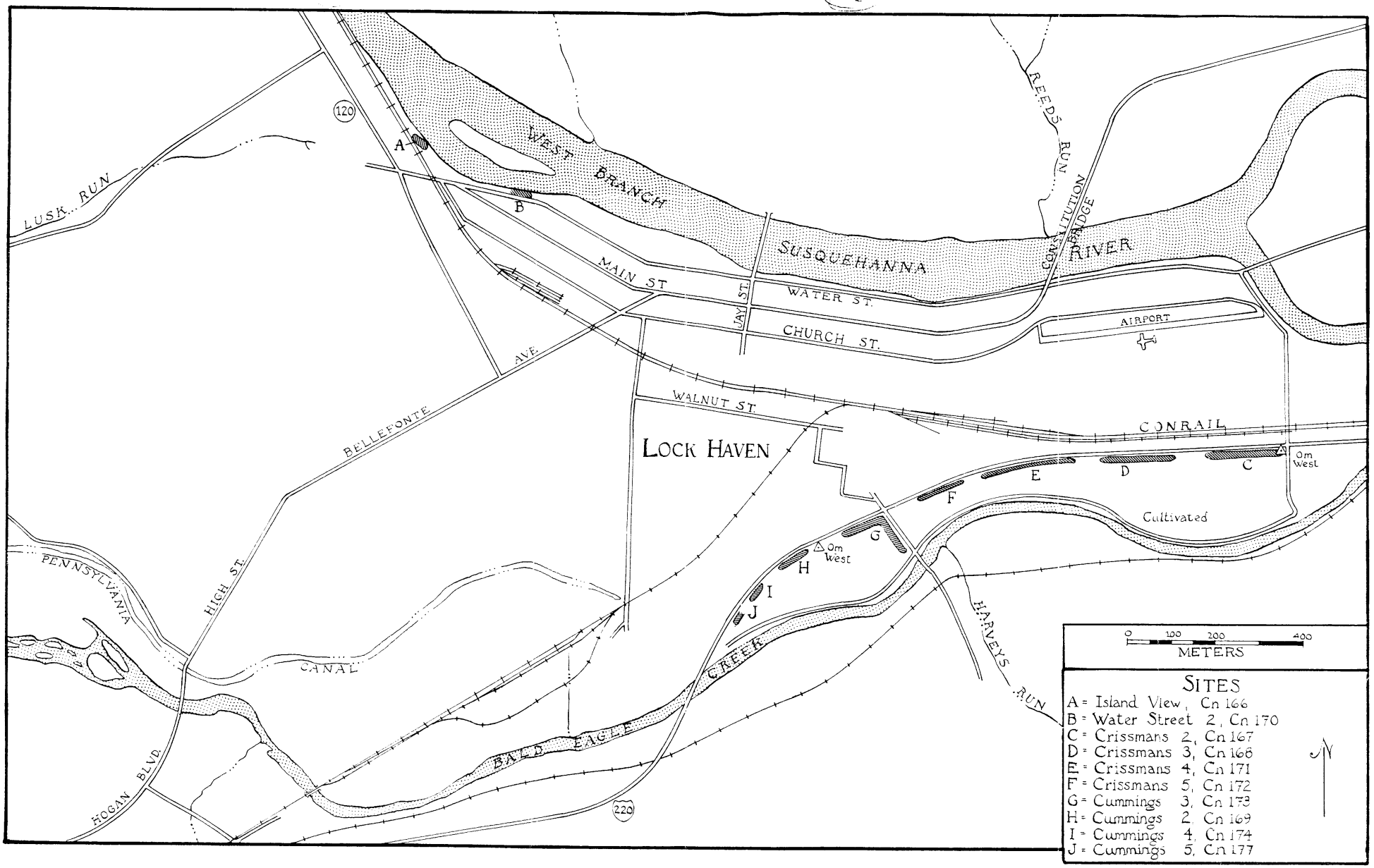
Six previously unidentified archaeological sites were discovered during the course of the fieldwork described below. These latter sites included Water Street Site 2 (36Cn170), Crissmans Sites 4 and 5 (36Cn171 and 36Cn172), and Cummings Sites 3, 4, and 5 (36Cn173, 36Cn174, and 36Cn177). Detailed descriptions of the fieldwork conducted at each site are provided in Section 6.1.3 below.

6.1.2 Setting

At the time of fieldwork, the various levee segments under investigation exhibited a wide variety of topographic characteristics and vegetation types. The Susquehanna River upstream tie-out was within a residential area covered by lawns, shade trees, and a gravel parking area. The topography in the immediate vicinity consisted of gently sloping hillside terrain dropping off towards the West Branch of the Susquehanna River, located approximately 64 m (300') to the northeast. The soils covering the area were mapped as Berks channery silt loam (Figure 4.1)--a well drained, moderately sloping upland soil. Much of the area was covered by deep shale fill which had been placed to form the above-mentioned parking area.

From the Susquehanna upstream tie-out, the levee system extended along steep banks to Island View Park--a small area of park land owned and maintained by Lock Haven University. Island View Park comprises

Figure 6.1 Locations of Archaeological Sites along the Lock Haven Flood Protection Project Alignment.


LUSK RUN
120
A
B
WEST BRANCH
SUSQUEHANNA
RIVER
REEDS RUN
CONSTITUTION BRIDGE
MAIN ST
JAY ST
WATER ST
CHURCH ST
AIRPORT
AVE
WALNUT ST
CONRAIL
BELLEFONTE
LOCK HAVEN
0m West
C
D
E
F
G
H
I
J
Cultivated
PENNSYLVANIA
HIGH ST
CANAL
BALD EAGLE
CREEK
HARVEYS RUN
HOGAN BLVD
220
0 100 200 400
METERS
SITES
A = Island View, Cn 166
B = Water Street 2, Cn 170
C = Crissmans 2, Cn 167
D = Crissmans 3, Cn 168
E = Crissmans 4, Cn 171
F = Crissmans 5, Cn 172
G = Cummings 3, Cn 173
H = Cummings 2 Cn 169
I = Cummings 4, Cn 174
J = Cummings 5, Cn 177
N

approximately 0.7 acres, and is bordered on the north and east by the West Branch of the Susquehanna River, on the southeast by an asphalt parking area, and on the southwest by Conrail tracks. to the northeast, the park pinches out against the steep bank of the West Branch of the Susquehanna River. Beyond its immediate boundaries, Island View Park is surrounded by extensive residential, commercial, and institutional development in the form of roads, parking lots, tennis courts, small residential and commercial establishments, and Lock Haven University.

At the time of fieldwork, Island View Park comprised two distinct topographic settings. Near the West Branch were low lying, grass covered sand spits used as a boat launching area. Immediately to the southeast, the land rose steeply to an elevation of approximately 18-19' above the river, and then leveled off to form a grass-covered area on the first terrace above the West Branch. The soils of this area are mapped as Ashton silt loams (Figure 4.1; USDA 1966). An access ramp extending from the parking lot to the boating access area cut through this latter topographic feature.

Between Island View Park and the Sixth Street/Water Street intersection, the levee alignment crossed the above-mentioned parking area and several small commercial and residential properties. Much of this latter area was covered by paving, although small areas of lawn existed within the commercial and residential properties. Within this area, level terrain comprising the first terrace above the West Branch prevailed. The parking area was not a part of the project area for this study. The several small commercial and residential properties were covered by pavement or were not accessible for testing.

Beyond the Sixth Street/Water Street intersection, the levee alignment followed a narrow municipal park to Fourth Street. The park in question comprised a level area approximately 8 m (25') lying between Water Street and the steep bank of the West Branch. This area was grass-covered, and comprised the riverside margin of the first terrace above the river. Again, the soils of the area were mapped as Ashton silt loam (Figure 4.1; USDA 1966).

From Fourth Street, the levee alignment continued along the West Branch bank to Memorial Park near the eastern terminus of the point of land on which Lock Haven is situated. From Memorial Park, it followed Route T-375 across the point of land to the U.S Route 220 embankment. These latter areas were not a part of the project area for this study.

From the T-375 underpass at the U.S. Route 220 embankment, the levee alignment turned west to follow the embankment to Bald Eagle Creek. Two distinct levee alignment segments comprised this portion of the project area. Between the T-375 underpass and the Castanea Fire Company property, the alignment paralleled the southern margin of the highway embankment. Here, it traversed the above-described first Wisconsin terrace above the Bald Eagle Creek floodplain--an area of level to gently undulating terrain. At the time of fieldwork, this alignment segment lay entirely within a cultivated field covered first by mature corn and then, after

harvest, by corn stubble. The entirety of the alignment lay within an area mapped as Ashton silt loam (Figure 4.1; USDA 1966).

Beyond the Castanea Fire Company property, the levee alignment continued to follow the U.S. Route 220 embankment to Bald Eagle Creek. From Hanna Street to the west, this latter alignment segment lay within areas of grass, scrub, and secondary growth vegetation. With the exception of its westernmost terminus, the segment again crossed the gently undulating Wisconsin terrace, and lay primarily within areas mapped as Ashton silt loam. However, it also crossed small pockets of Melvin and Newark silt loam (Figure 4.1; USDA 1966).

From the U.S. Route 220 bridge over the Bald Eagle Creek, the levee alignment continued to the west across the lands of the Hammermill Paper Company to the Bald Eagle Creek upstream tie-out. The Hammermill property was not within the project area for this study. The Bald Eagle Creek upstream tie-out was situated immediately across the old Pennsylvania canal, and comprised level, grass-covered terrain bordering the canal and gently sloping grass covered and cultivated terrain immediately beyond. The area encompassed by the tie-out is mapped as Sequatchie fine sandy loam (Figure 4.1; USDA 1966).

6.1.3 Results of Fieldwork

6.1.3.1 Susquehanna Upstream Tie Out: As indicated above (see Section 2.0), the proposed Lock Haven Flood Protection Project ties out on high ground immediately to the west of Lock Haven University. In this area, a levee segment will cross the Conrail tracks and a deep trench formed by the railroad embankment, and will then tie out against a steep slope of shale fill located just beyond the trench. Lusk Run, a small stream that presently flows in a northerly direction across the levee alignment just to the east of the tie out, will be relocated to the west of the tie out to avoid penetrating the levee in this area. The relocated run will cross an area of gently sloping, residential lawn, the above-mentioned area of shale fill, and the tracks before entering the West Branch of the Susquehanna River.

During the study described herein, the above described areas were examined, but due to a number of factors, actual field survey was either infeasible or deemed to be unnecessary. Access was denied to the area of residential lawn subject to effects from relocating Lusk Run. Considering the slope of the terrain and the proximity of more desirable habitation locations closer to the West Branch of the Susquehanna River, the lawn in question had a low probability of containing archaeological resources.

Immediately to the north of the above-described yard was the area of shale fill, which is currently occupied by a private garage and parking area. The presence of the fill precluded effective testing in this locality. If intact, the soils underlying the fill were probably a continuation of those on the lawn, and thus can be assumed to have a low probability of site occurrence.

Beyond the area of shale fill were the Conrail tracks, which lay on an elevated railroad bed that again precluded archaeological testing. Furthermore, no archaeological resources could have survived the massive disturbance caused by grading and filling associated with the construction of this railroad bed. Immediately beyond the railroad bed, the West Branch bank dropped off steeply to low-lying gravel bars and sand spits at the River's margin. Again, the probability that archaeological resources were present was negligible. From the railroad embankment, the proposed levee alignment traversed steep banks and sand spits until it reached Island View Park.

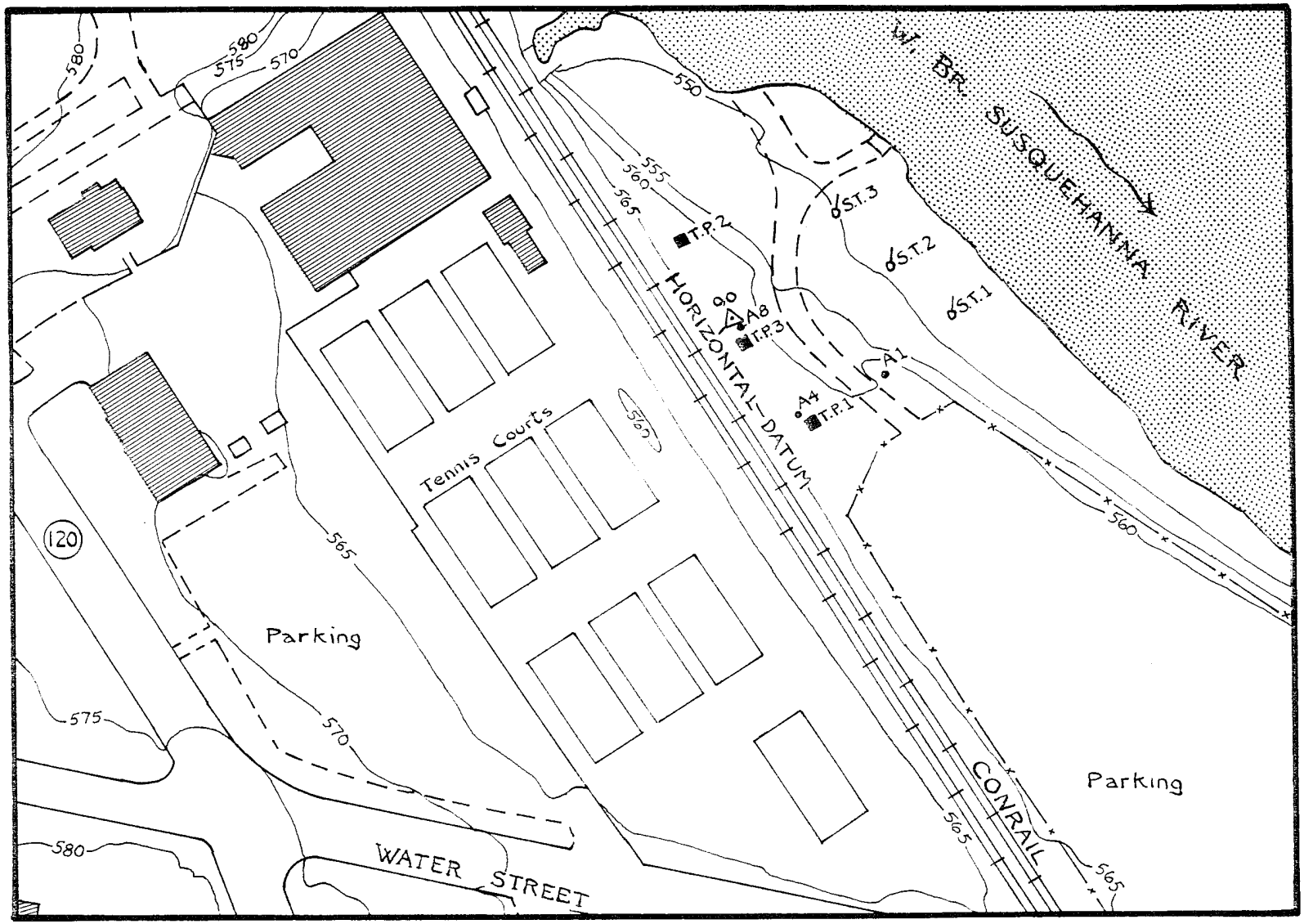
6.1.3.2 Island View Park and the Island View Site (36Cn166): As indicated above, a prehistoric archaeological site was discovered within Island View Park during previous research for the Lock Haven Flood Protection Project (Hay et al. 1978; see above, Section 3.4). During the present project, this site was further evaluated by excavating three 2 m x 2 m (6.5' x 6.5') test pits within the remnant of the site that had survived construction of a boating access ramp through the park.

Island View Park consists of a small, 0.7-acre grass-covered park owned and maintained by Lock Haven University. The park is located near the intersection of Water and West Church Streets, and is bordered on the southeast by a Lock Haven University parking lot, on the southwest by the above-mentioned Conrail tracks, and on the northeast by the West Branch of the Susquehanna River. To the northwest, the park pinches out against the West Branch Bank (Figure 6.2).

Originally, Island View Park included two distinct landforms. To the south and east, the land was level and lay at an elevation of 5.5 m (18') to 5.9 m (20') above the Susquehanna River. Moving towards the River, a steep bank led down to a lower, gently sloping land surface consisting of sand spits along the water's edge. During previous research within the park, the Island View Site was discovered on the higher of these two land surfaces. Between that time and the present study, however, a boating access ramp was cut through the higher land surface to connect the lower land surface with the above-mentioned parking lot. Approximately 30% of the higher land surface was removed as a result of this construction activity.

Prior to initiating excavations at the Island View Site, an arbitrary datum was established near the center of the site, and was tied in to the concrete base of a lamp pole located within the lower portion of the park. A site grid was then established using a grid north-south orientation of 335o14'. Three 2 m x 2 m (6.5' x 6.5') test pits were then laid out, and were labeled Units 1, 2, and 3 (Figure 6.3). Unit 1 (S25E2) was located at the easternmost end of the site, near the Lock Haven University parking lot. Unit 2 (N17E2) was placed at the opposite, western end of the park where the remnant left by boat-ramp construction pinched out against the West Branch bank. Unit 3 (S4E0) was situated approximately midway between Units 1 and 2.

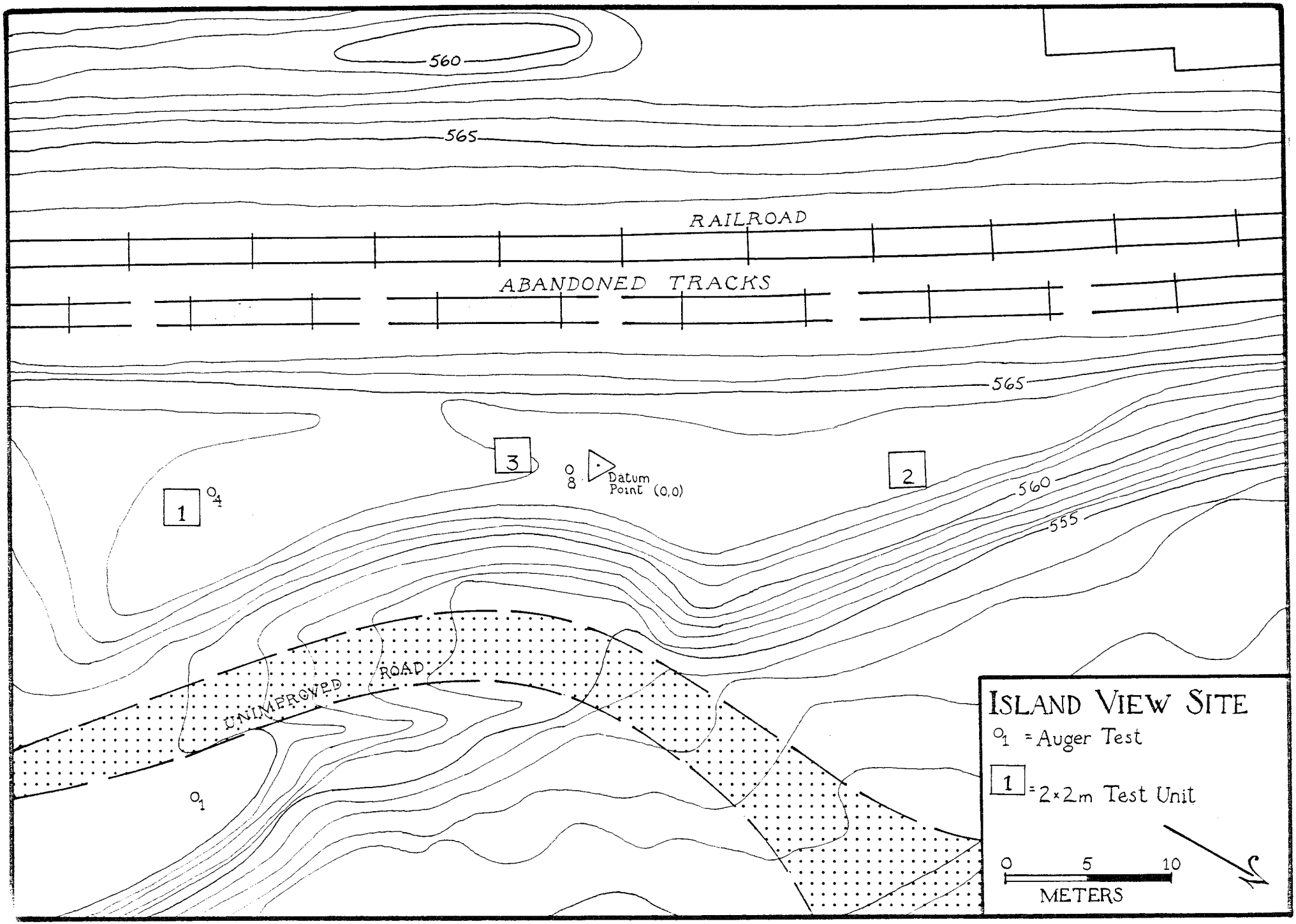
Figure 6.2 General Vicinity of the Island View Site (36Cn166).



■T.P.2 = Test pit
•A8 = Auger test
ó S.T.1 = Shovel test

50 0 50 100 150 FEET
20 0 20 40 METERS

Figure 6.3 Augur Test and Test Unit Locations at the Island View Site (36Cn166).


560
565
RAILROAD
ABANDONED TRACKS
565
3
2
1
Datum Point (0,0)
560
555
UNIMPROVED ROAD
ISLAND VIEW SITE
= Auger Test
= 2×2m Test Unit
0 5 10
METERS

Actual excavation of these test pits was preceded by the excavation of three auger tests, which were designed to provide preliminary information concerning site stratigraphy and artifact content. These tests revealed several levels of dark grey silt loam fill containing historic and modern artifacts and extending to depths of approximately 50-60 cm (20-24") below the surface. Underlying these levels of fill, to depths of approximately 100 cm (34"), was a dark brown to brown sandy loam containing prehistoric flakes and sherds. Below this latter level was a light brown sandy loam that produced no cultural material. In most probes, this level could only be tested to depths of 115 cm (45") to 150 cm (59") due to auger probe "refusals" when rocks were encountered. One probe, however, reached a depth of 300 cm (118"), and indicated that below the 100 cm (45") level light brown sandy loams extended throughout.

Excavation of Unit 1, Island View Site: Excavations in Units 1, 2, and 3 revealed soil profiles generally similar to those encountered in the probes, but provided additional details concerning internal site structure (Figures 6.4-6.6). In Unit 1, the uppermost level encountered consisted of a brownish yellow, mottled and streaked sandy loam containing prehistoric, historic, and modern artifacts. This level extended to a depth of approximately 30 cm (12') and was termed Zone I. It was interpreted as fill deposited during construction of the boating access ramp.

Underlying Zone I was a dark, greyish brown silt loam which again contained prehistoric, historic, and modern artifacts. This level was termed Zone II, and was interpreted as representing the buried topsoil dating to the period prior to boat-ramp construction. Zone II was rich in ash, coal, and clinkers. In addition, an historic feature was encountered within it, and consisted of a segment of asphalt pavement. Zone II extended to a depth of 45 cm (18").

Beneath Zone II at 45 cm (18") was a dark brown sandy loam which again contained both historic and prehistoric artifacts. Based on correlations with Units 2 and 3 (see below, this Section), this latter level was termed Zone IV, and was interpreted as a second buried topsoil, in this case perhaps representing the land surface prior to and/or during early Euro-American settlement in the area. A second historic feature was encountered within Zone IV and consisted of a trench filled with rubble consisting of angular rocks, brick fragments, plaster, and ash (Plate 6.2). The function of this trench was unclear. Near the base of Zone IV and extending into Zone V was a second feature consisting of an area of reddened earth. This feature was interpreted as representing an open hearth, and was potentially of either historic or prehistoric age. Because charred organic remains were not evident in the fill of this feature, it was not flotation processed. However, a soil sample was collected for possible future laboratory analysis.

Zone IV extended to 65 cm (26") and overlay Zone V, a brown to dark brown silt loam to sandy silt loam that contained prehistoric lithic and ceramic artifacts only. Zone V extended to 135 cm (53"). Highest artifact densities were encountered between 85-115 cm (34"-45"). In these

Figure 6.4 Stratigraphic Profile, Test Unit 1, Island View Site (36Cn166)

I Dark brown (10YR3/3) clay loam with bands of dark yellowish brown (10YR4/4) clay loam. Topsoil and recent fill.

II Very dark grey (10YR3/1) grey silt loam with coal, cinder, and asphalt pieces. Historic horizon.

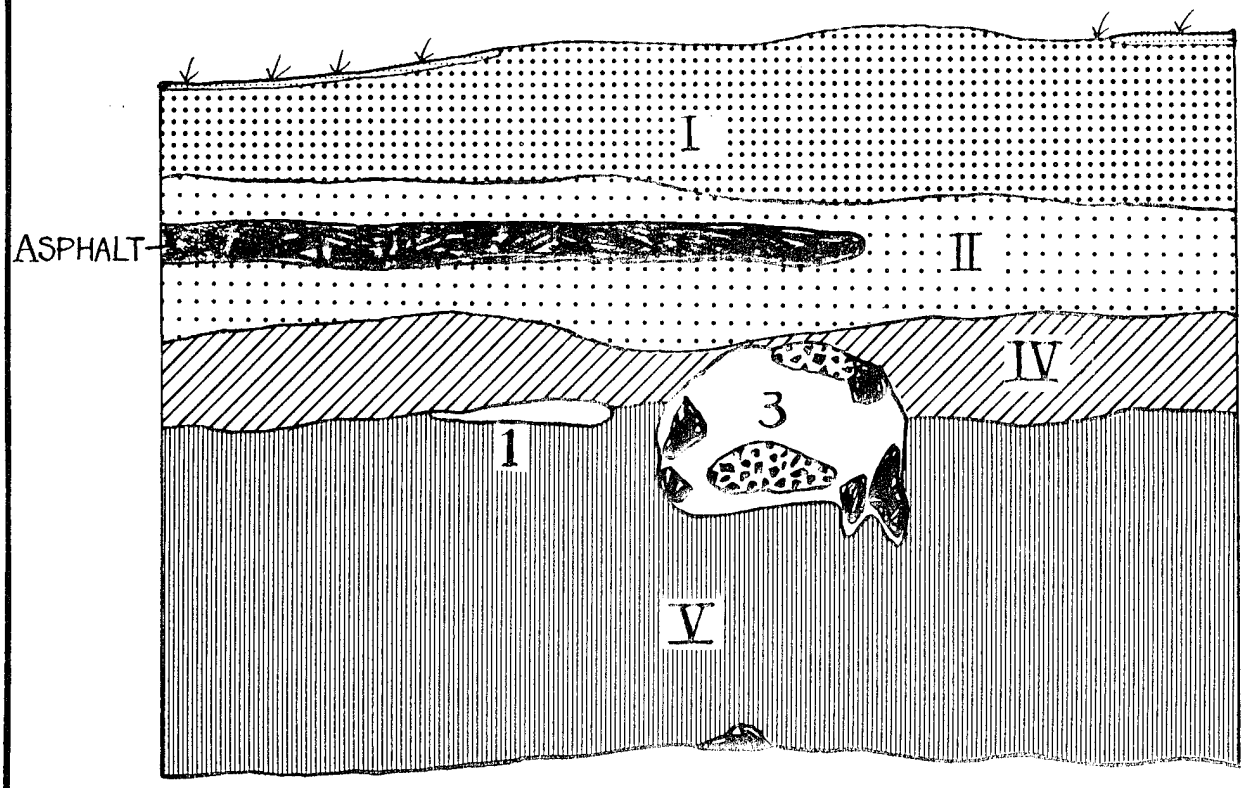
IV Very dark greyish brown (10YR3/2) sandy loam. Historic and prehistoric horizon.

V Dark yellowish brown (10YR3/4) silt loam. Prehistoric horizon.

Feature 1: Dark reddish brown (5YR3/4) brown clay loam.

Feature 3: Rubble-filled trench.

Island View Site
Unit 1, North Wall



= Rock

= Plaster

0 10 20 cm

Figure 6.5 Stratigraphic Profile, Test Unit 2, Island View Site (36Cn166)

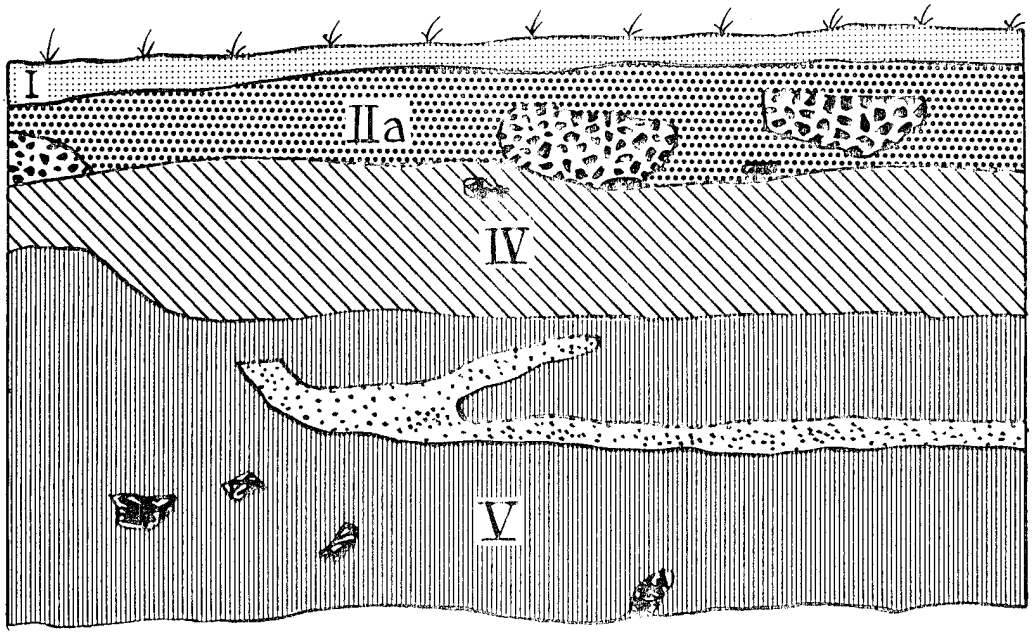
I Dark brown (10YR3/3) clay loam with bands of dark yellowish brown (10YR4/4) clay loam. Topsoil and recent fill.

IIa Very dark grey sandy loam (10YR3/1). Historic horizon.

IV Very dark greyish brown (19YR3/2) sandy loam. Historic horizon.

V Dark yellow brown (10YR3/4) silt loam. Prehistoric horizon.

Island View Site
Unit 2, South Wall



= CHARCOAL

= ROCK

= CEMENT

0 10 20 cm

Figure 6.6 Stratigraphic Profile, Test Unit 3, Island View Site (36Cn166)

I Dark brown (10YR3/3) clay loam with bands of dark yellowish brown (10YR4/4) clay loam. Topsoil and recent fill.

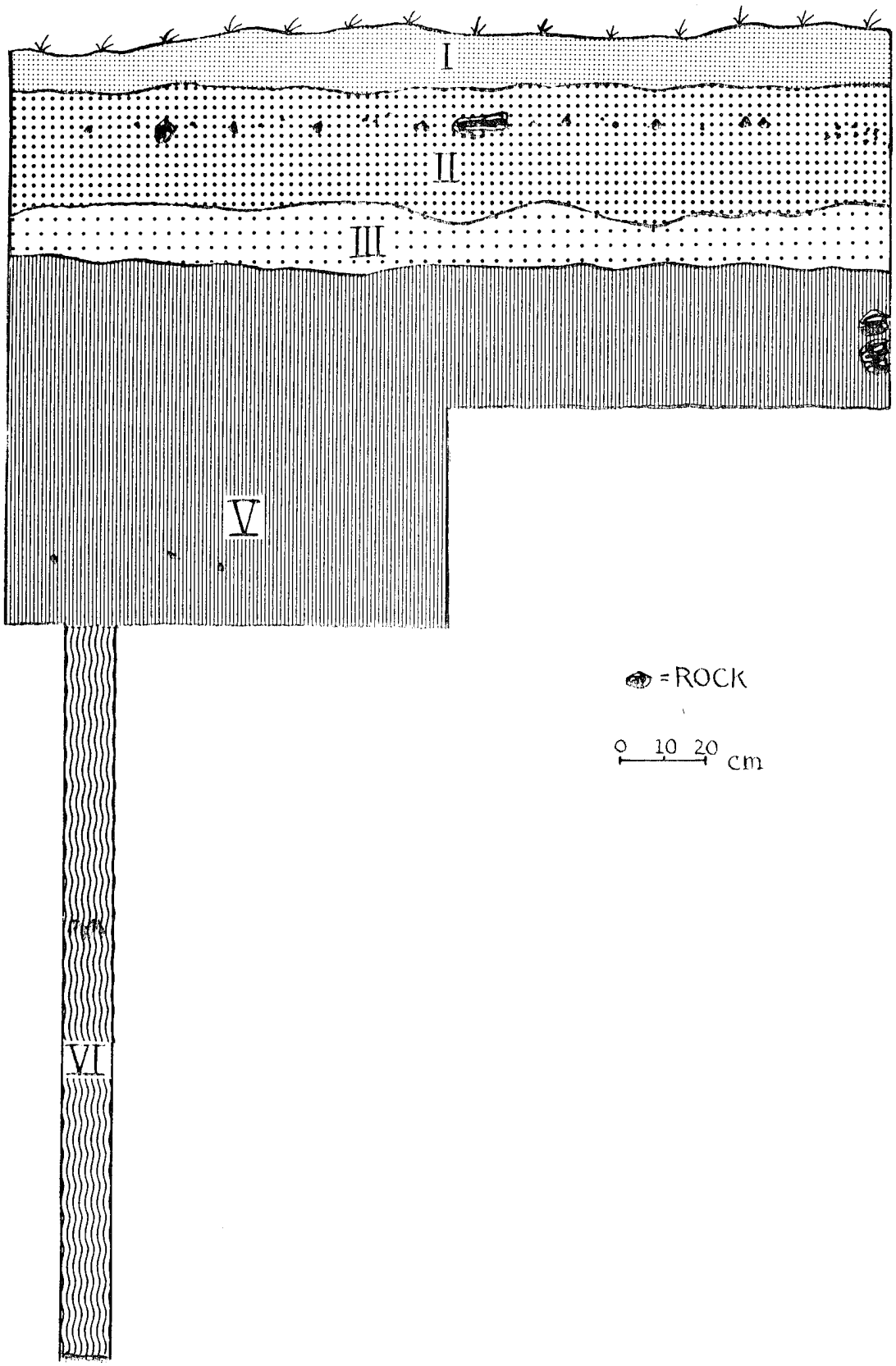
II Very dark grey (10YR3/1) silt loam with thin bands of brown sand and coal dust. Fill.

III Dark yellowish brown (1oYR4/4) sandy loam with coal and cinder pieces. Historic horizon.

V Dark yellowish brown (10YR3/4) silt loam. Prehistoric horizon.

VI Dark yellowish brown (10YR4/4) clay loam, sand content increases with depth.

Island View Site
Unit 3, West Wall



latter levels, approximately 200 to 400 artifacts per 10 cm (4") level were recovered. Near the bottom of Zone V, artifact densities dropped dramatically to 5-10 artifacts per 10 cm (4") level. Below Zone V was Zone VI, a light brown clay loam which was sterile of artifacts.

The prehistoric artifacts recovered from Zones IV and V in Unit 1 consisted primarily of grit tempered, cord-marked body sherds and chipped lithic artifacts. The sherds were recovered from Zone IV and the upper two 10-cm levels of Zone V only. Below these upper levels, only chipped lithic artifacts were present, consisting primarily of jasper, flint, chert, and rhyolite flakes. Near the base of Zone V two Archaic Period projectile points, later identified as Brewerton Side Notched and a Sylvan Side Notched, were found (see below, Section 6.2.2.1).

Excavation of Unit 3, Island View Site: In Unit 3, excavations revealed a profile generally similar to that encountered in Unit 1. The uppermost level again consisted of a streaked, yellow brown sandy loam interpreted as fill deposited during construction of the boating access ramp. This level extended to approximately 15 cm (6") and was underlain by Zone II--a dark greyish brown silt loam containing ash, coal, and clinkers as well as prehistoric, historic, and modern artifacts. Beneath Zone II at a depth of 40 cm was Zone III, which consisted of deposits generally similar to Zone II, but was slightly lighter in color and contained less coal and ash. Zone III extended to approximately 50 cm (20"), and was underlain directly by Zone V. Thus, Zone IV, the second buried A-soil horizon, was absent in the Unit 3 stratigraphic sequence.

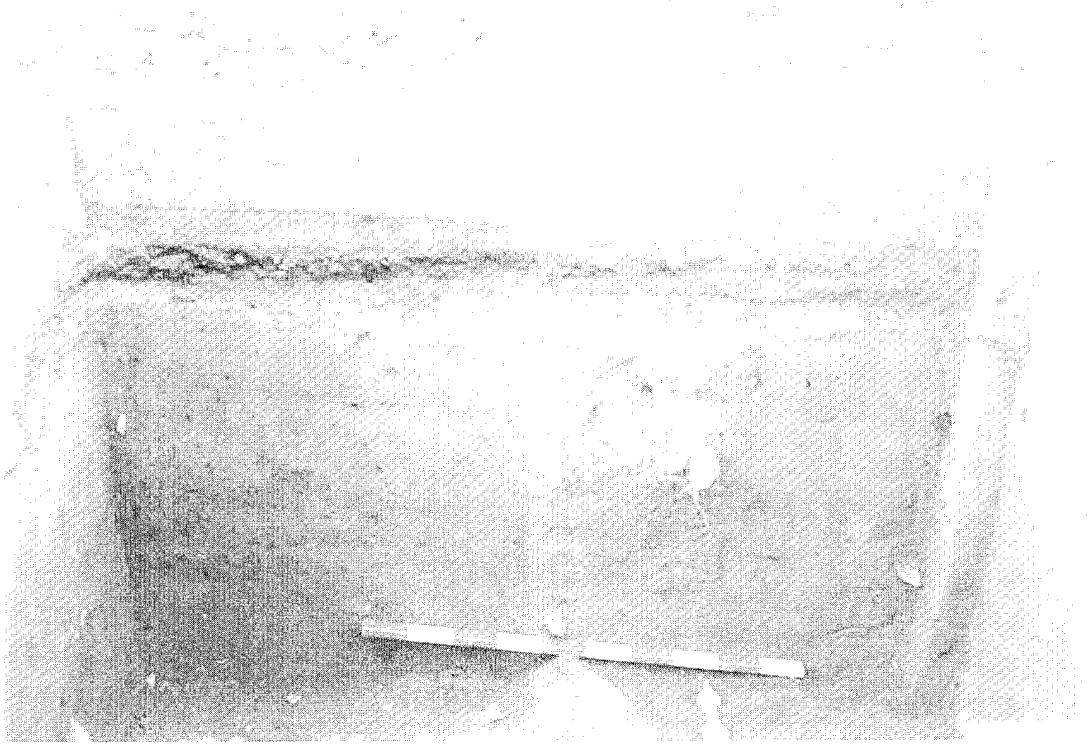
Zone V in Unit 3 appeared to be similar in all respects to the equivalent zone in Unit 1. As in Unit 1, only prehistoric artifacts were recovered from this lower zone. Unlike Unit 1, however, ceramic artifacts were rare, while chipped lithic artifacts, consisting primarily of flakes of jasper, chert, flint, and rhyolite, were numerous. No projectile points were found. Again, artifact densities were high, ranging from 200-400 in a 10-cm (5") level. Below Zone V, Zone VI was again encountered, and was sterile of cultural remains.

Excavation of Unit 2, Island View Site: Unit 2 revealed a soil profile that was generally similar to Units 1 and 3. Zone I was again the uppermost level, but extended only to a depth of 5 cm (2"). It was underlain by Zone II, which extended to approximately 20 cm (8"). In Unit 2, Zone II contained two historic features consisting of single-course brick wall remnants. These remnants lacked foundation trenches, and were therefore interpreted as garden or walkway margins (Plate 6.1).

Below Zone II in Unit 2 was Zone IV--the buried topsoil also encountered in Unit 1. Thus, Zone III was missing from the Unit 2 sequence. Zone IV extended to a depth of 55 cm (22") and again overlay Zone V, which extended to 110 cm (43"). In Unit 2, Zone V produced both ceramic and chipped lithic artifacts. The ceramic artifacts consisted of several grit tempered, cord-marked body sherds while chipped lithic artifacts consisted primarily of jasper, flint, chert, and rhyolite flakes. In addition, five projectile points were recovered, and were

Plate 6.1 Brick Wall Remnant in Unit 2, Island View Site (36Cn166).

Plate 6.2 Stratigraphic Profile, Unit 1, Island View Site (36Cn166). Notice layers of historic fill at top, rubble-filled trench (Feature 3), and undisturbed levels below.



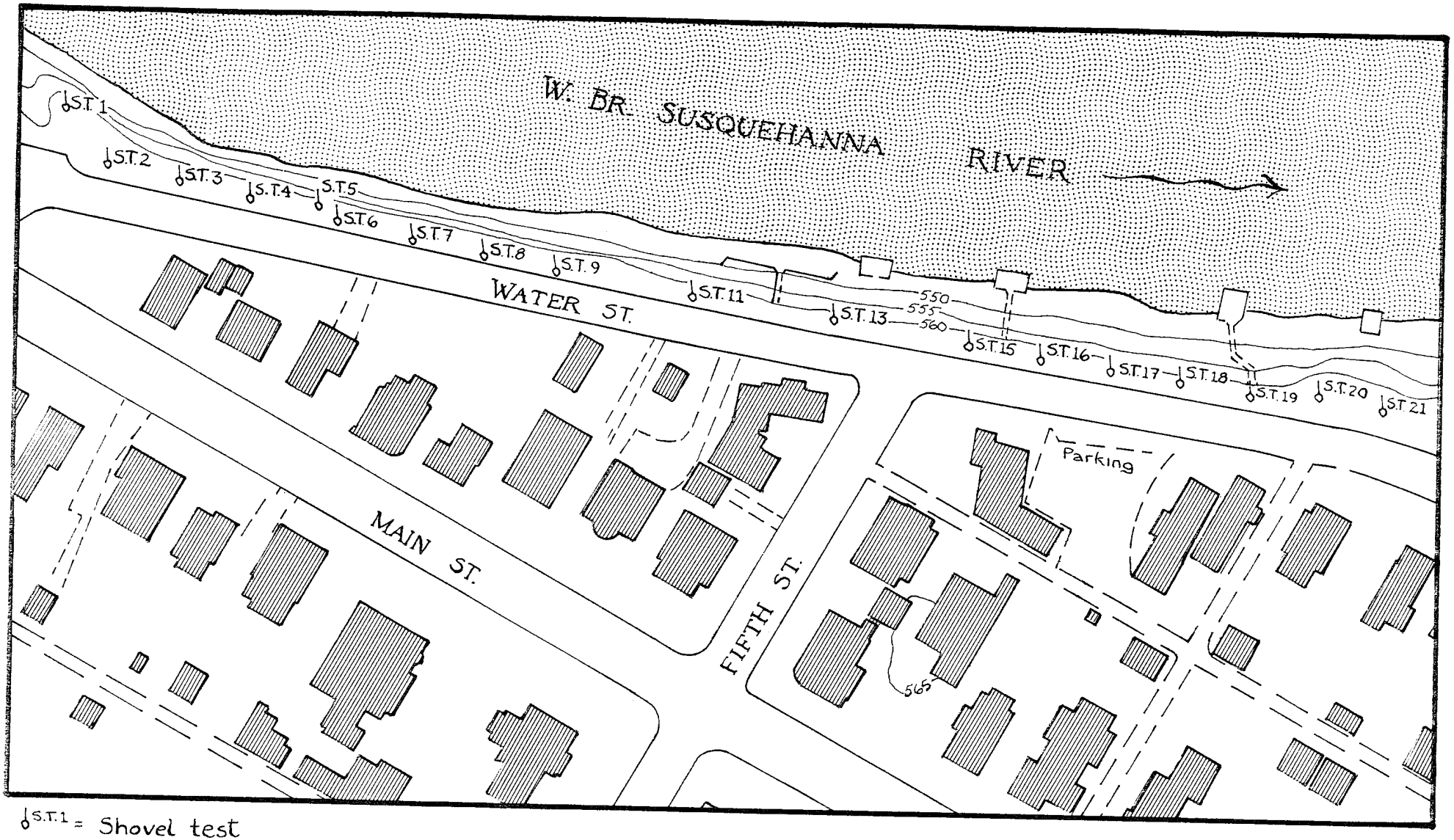
later identified as including a Sylvan Side-Notched, a Sylvan Stemmed, a Brewerton Corner-Notched, a Jacks Reef Pentagonal, and a Late Woodland triangle (see below, Section 6.2.2.1). In contrast to Unit 1, the artifacts from Unit 2 did not seem to exhibit a clear temporal sequence. Instead, earlier materials, such as the Brewerton point, were in stratigraphic positions above later materials such as the ceramic artifacts and the late Woodland triangle point.

Excavations at the Island View Site--Discussion: Collectively, the results of excavation at the Island View Site provided a preliminary basis for interpreting the occupational history of the site. The first buried topsoil (Zone II) was interpreted as the surface of the park prior to construction of the boating-access ramp. This surface was probably created by the deposition of topsoil fill at the time the park was established. The presence within Zone II of several historic features, including the brick garden or walkway margins and the asphalt pavements, indicated that an earlier land surface existed with Zone II. This surface presumably existed prior to the establishment of the park. According to passers-by, Island View Park and its immediate surroundings had once been occupied by closely spaced residences with associated yards. Presumably, the asphalt and brick features in Zone II were associated with these residences.

Below Zone II, Zone III represented a continuation of similar deposits, and was interpreted as a mixture of alluvium, ash, and trash that had accumulated during the period of historic occupancy of the Island View Park area. The various features which originated in Zones II and IV represented various unidentified uses of the area during the period in question. Below Zones II and III was Zone IV, a second buried topsoil. This latter topsoil was interpreted as the original A-horizon soil in the Island View Park vicinity. It probably represented the land surface at the time of first Euro-American occupation of the area. If this interpretation was correct, then the underlying level, Zone V, presumably represented alluvial deposition over a considerable span of time, leading ultimately to the formation of the relatively stable surface represented by the top of Zone IV. Since prehistoric artifacts were encountered throughout Zone V, repeated occupations of the site by prehistoric Indians presumably occurred during the period of zone deposition. Zone VI, underlying Zone V, was interpreted as predating the first human occupation of the site.

Assuming the above interpretation was correct, the Island View Site contained intact stratigraphic sequences covering both historic and prehistoric time. Although only a remnant of a once larger site, the existing site might still be expected to contribute significant information concerning changes in artifact style and material culture during the period of prehistoric occupation and during the early history of Lock Haven. Therefore, the proposed interpretation was more fully evaluated during laboratory analyses of the artifacts recovered from the site (see below, Section 6.2.2).

Figure 6.7 Shovel Test Locations Along Water Street.



S.T. 1 = Shovel test

50 0 50 100 150 FEET

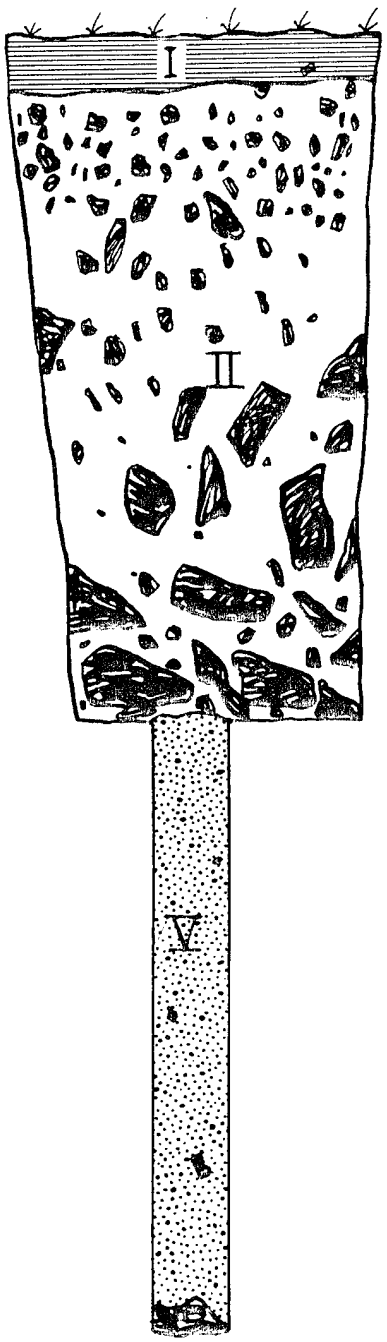
20 0 20 40 METERS

Figure 6.8 Soil Profiles, Water Street Shovel Tests 17 and 19.

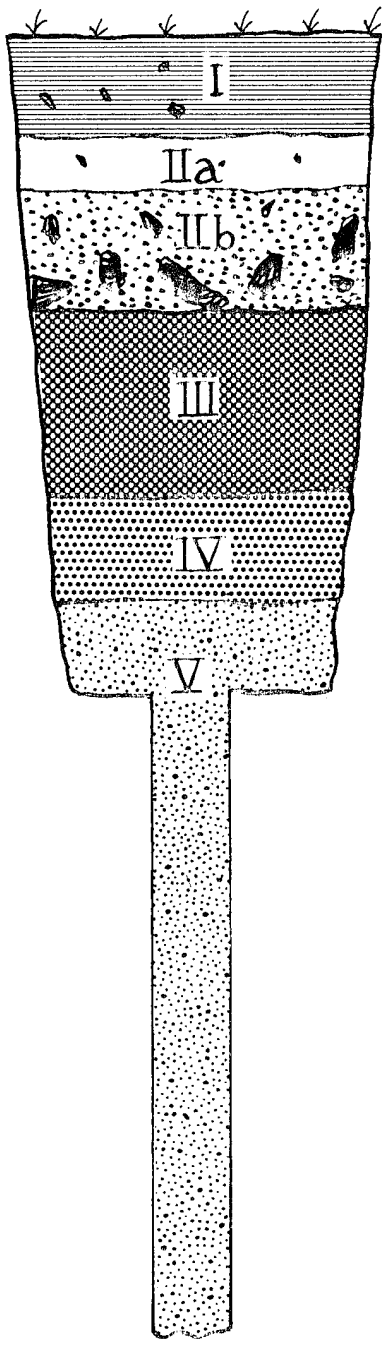
I	Dark brown clay loam topsoil
II	Greyish brown silt loam fill with rock, gravel, cinder and coal
IIa	Brown clay loam fill
IIb	Black fill with cinders and ash
III	Dark brown sandy loam buried A-horizon
IV	Brown sandy loam buried B-horizon
V	Orange brown silt loam C-horizon

WATER STREET

SHOVEL TEST 7



SITE 2
SHOVEL TEST 19



= ROCK

0 10 cm

These results indicated that although fill covered the entirety of the park along Water Street, an intact soil horizon existed beneath the fill in one small locality measuring approximately 60 m x 60 m (195' x 20'). In this locality, a buried A-horizon soil produced prehistoric artifacts. The area in question was thus interpreted as a remnant of a site that had been extensively disturbed by topsoil stripping and fill placement. The site represented by this remnant was termed Water Street Site 2 (Figure 6.9). While additional remnants of this site may exist in areas where the fill could not be penetrated, the extent of topsoil stripping in areas where the fill was penetrated rendered this possibility unlikely.

6.1.3.5 The U.S. Route 220 Corridor from Route T-375 to the Castanea Township Fire Company, Crissmans Sites 2-5 (36Cn167, 36Cn168, 36Cn171, and 36Cn172): From the strip of city park described above, the levee alignment parallels Water Street until reaching Memorial Park at the eastern end of Lock Haven. From the Memorial Park area, the alignment follows Route T-375 across the point of land formed by the Bald Eagle Creek-West Branch confluence to the underpass where Route T-375 crosses U.S. Route 220 (Figure 2.2). These levee segments were not a part of the present study.

From the Route T-375 underpass, the levee alignment follows the southern margin of the U.S. Route 220 embankment to the Castanea Township Fire Company property near Hanna Street (Figure 2.2). Within this latter levee alignment, Phase I survey procedures were used to confirm the presence of previously recorded archaeological sites, to locate previously unrecorded sites, and to determine whether buried or deeply stratified sites were present. In addition, Phase II research was conducted at sites to evaluate their eligibility for inclusion on the National Register of Historic Places.

At the time of survey, the alignment between the Route T-375 underpass and the Castanea Township Fire Company property lay within the margins of a large cultivated field. This field exhibited gently undulating terrain forming the first terrace above the Bald Eagle Creek floodplain. During the Phase I survey, the alignment within this field was covered by mature corn. At the time of Phase II testing, the corn had been harvested and the field was covered by corn stubble.

Phase I Survey: As indicated above, Phase I survey procedures involved an intensive pedestrian surface survey and a detailed soils survey (see above, Sections 4.0 and 5.1; Figure 6.10). During the pedestrian surface survey, all artifacts were point-provenienced, and the resulting data were plotted on maps to reveal artifact clusters, or sites (see Section 5.1). The results of this procedure indicated that a thin but nearly continuous scatter of lithic debitage covered the entirety of the alignment between the Route T-375 underpass and the Castanea Township Fire Company property. However, several areas exhibiting a somewhat higher artifact density were discernible, and were identified as archaeological sites. Two of these corresponded in location to the

Figure 6.9 Shovel Test Locations at the Water Street Site 2 (36Cn170).

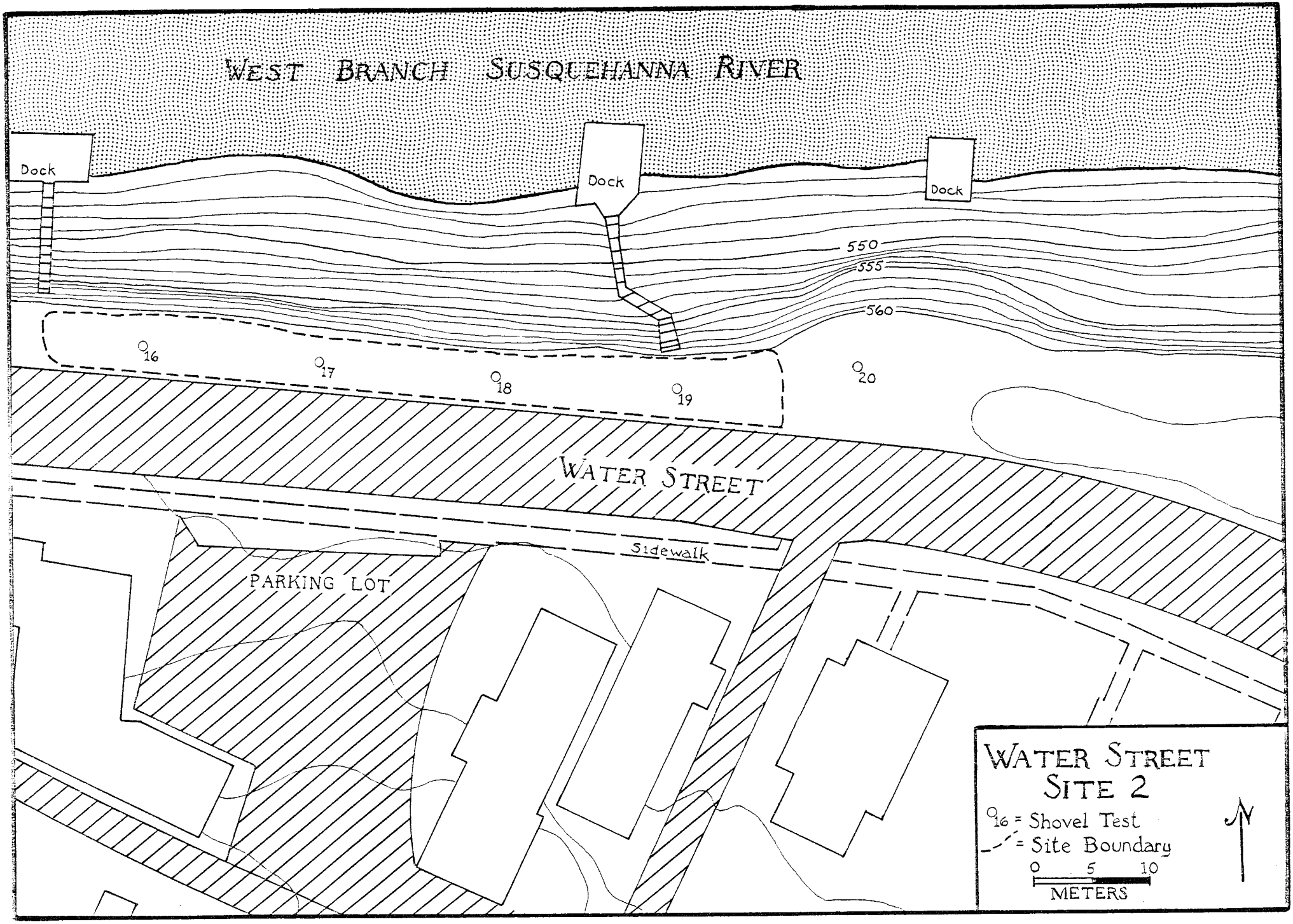
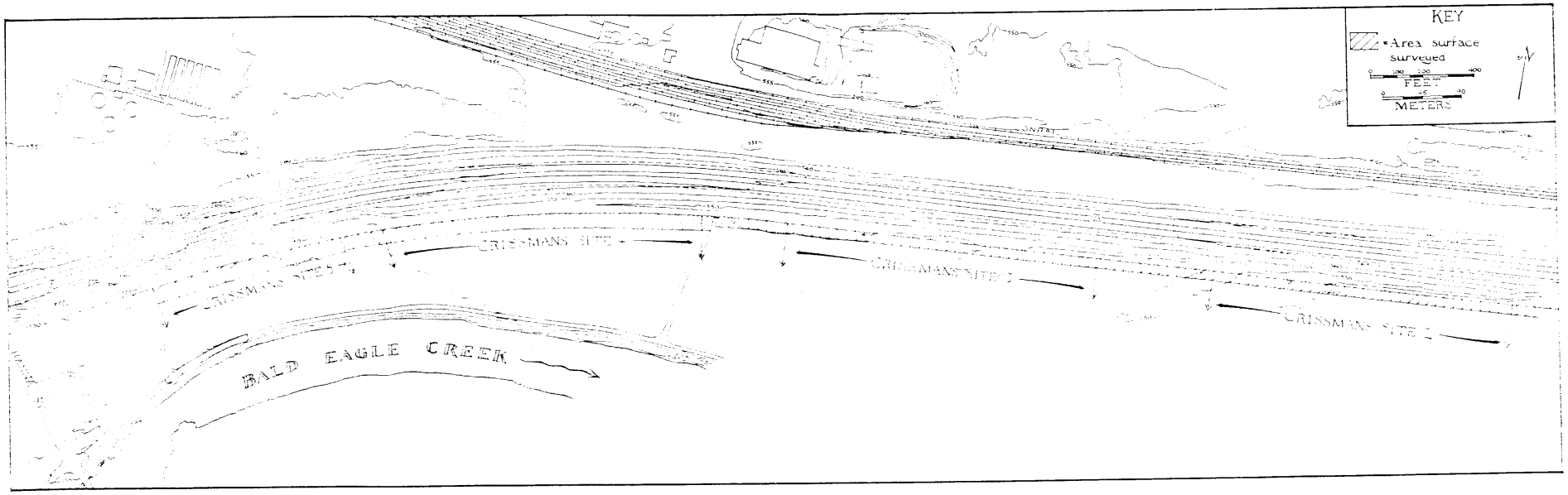

WEST BRANCH SUSQUEHANNA RIVER
Dock
Dock
Dock
550
555
560
16
17
18
19
20
WATER STREET
Sidewalk
PARKING LOT
WATER STREET
SITE 2
16 = Shovel Test
= Site Boundary
0 5 10
METERS

Figure 6.10 Areas Investigated and Site Locations, U.S. Route 220 Corridor between Route T-375 and the Castanea Fire Company.


KEY
Area surface surveyed
FEET
METERS
CRISSMAN SITE 4
CRISSMAN SITE 3
CRISSMAN SITE 2
BALD EAGLE CREEK

previously recorded sites identified as Crissmans Sites 2 and 3 (Figures 6.11 and 6.12). Two additional site clusters were also apparent, and were termed Crissmans Sites 4, and 5 (Figures 6.13 and 6.14). These sites were located within the western half of the large cultivated field to the south of U.S. Route 220 (Figure 6.10).

It should be emphasized that in the delineation of Crissmans Sites 2-5, site boundaries were broadly and to some extent arbitrarily defined to include both high density "core" areas and low density peripheral areas. Thus, some sites included spatial artifact clusters exhibiting higher artifact densities within their boundaries. In particular, Crissmans Site 4 included an obvious core area near its western boundary, a lesser artifact cluster just to the east, and an extensive peripheral area of low artifact density extending further to the east (Figure 6.13). Crissmans Site 5 included three distinct artifact clusters, one located near its eastern boundary, one near its western boundary, and a third approximately midway between the other two (Figure 6.14). In contrast, Crissmans Sites 2 and 3 exhibited sparse but evenly distributed artifact scatters (Figures 6.11 and 6.12).

In general, surface artifact samples from all four Crissmans Sites were small. Crissmans Site 2 produced only 28 artifacts from the surface, while Crissmans Sites 3, 4. and 5 produced 33, 200, and 42 respectively. Of these artifacts, only 2 were temporally diagnostic, including an Adena pint (Early Woodland) and a Late Woodland triangular point, both recovered from the "core" area of Crissmans Site 4. The remaining artifacts consisted primarily of flakes of jasper, flint, chert, and rhyolite. Several preforms and tools were also recovered (see below, Section 6.2).

As indicated above (see Section 4.0), a detailed soils survey of the alignment between the Route T-375 underpass and the Castanea Township Fire Company property was conducted. In general, this survey indicated that for the majority of its length, the U.S. Route 220 embankment corridor lay on an erosional surface, and that the soils on this surface were old (i.e., at least of Wisconsin age). Under these circumstances, the probability was negligible that buried archaeological remains were present. Thus, deep testing along the U.S. Route 220 corridor between the Route T-375 underpass an the Castanea Township Fire Company property was deemed unnecessary.

Phase II Survey: Following the completion of the Phase I survey, Phase II site testing was conducted at Crissmans Sites 2-5. Prior to the Phase I survey, site testing in this area had been proposed for Crissmans Sites 2 and 3 only, and included placing eight 2 m x 2 m (6.5' x 6.5') test units within each of these two sites. However, the results of the Phase I survey suggested that an alternative testing strategy would be more productive. As indicated above, Crissmans Sites 2 and 3 both proved to be very low-density lithic artifact scatters. While the newly discovered Crissmans Sites 4 and 5 also consisted of sparse lithic scatters, they exhibited higher artifact densities then Crissmans Sites 2 and 3, especially within the artifact clusters described above. They were therefore considered to have higher information potential.

Figure 6.11 Point Provenienced Artifact Find Spots and Test Unit Locations, Crissmans Site 2 (36Cn167).

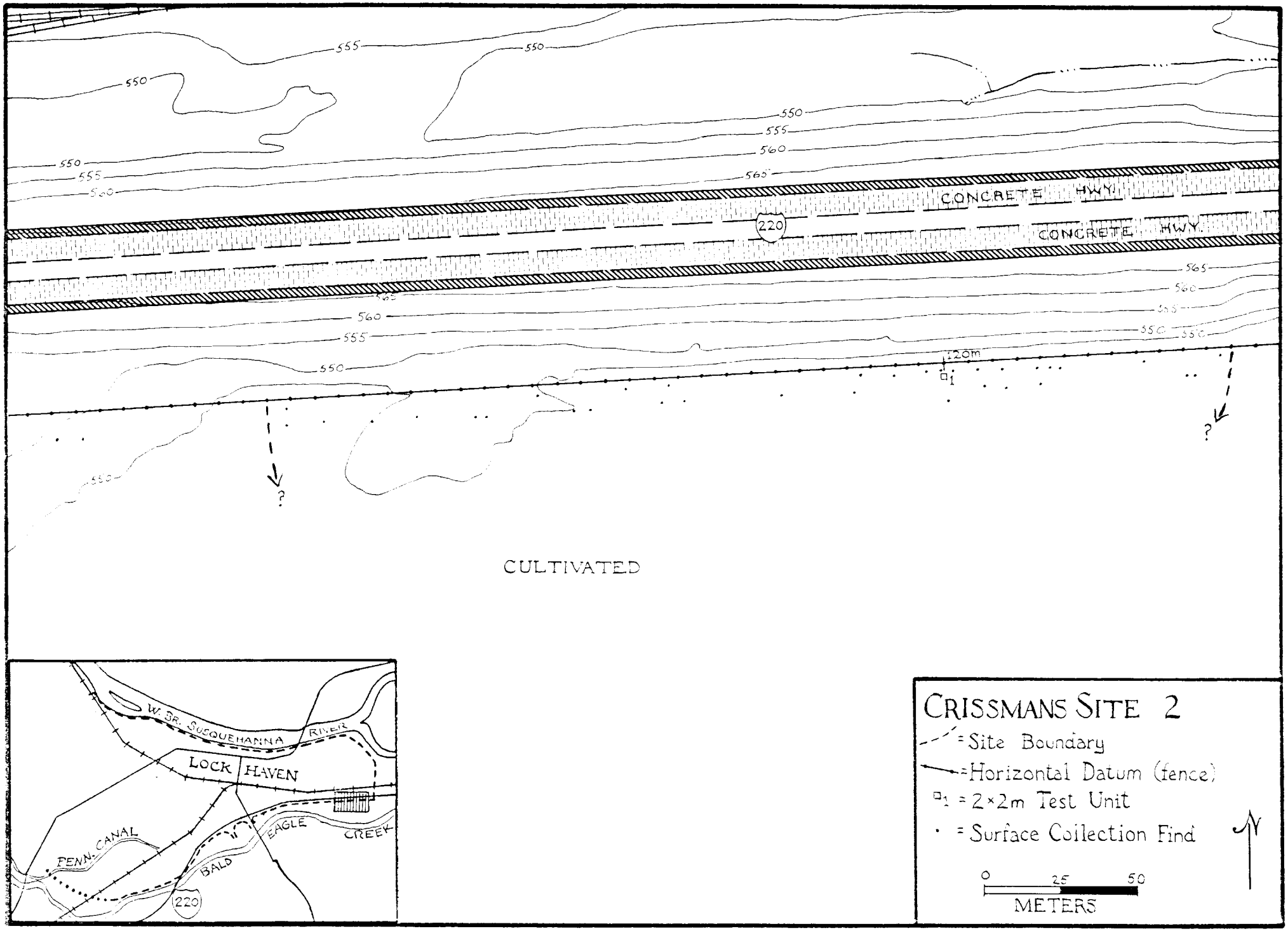

555
550
550
550
555
560
565
CONCRETE HWY.
220
CONCRETE HWY.
565
560
555
550
560
555
550
120m
1
?
?
CULTIVATED
W. BR. SUSQUEHANNA RIVER
LOCK HAVEN
PENN. CANAL
EAGLE CREEK
BALD
220
CRISSMANS SITE 2
= Site Boundary
= Horizontal Datum (fence)
1 = 2×2m Test Unit
= Surface Collection Find
0 25 50
METERS

Figure 6.12 Point Provenienced Artifact Find Spots and Test Unit Locations, Crissmans Site 3 (36Cn168).

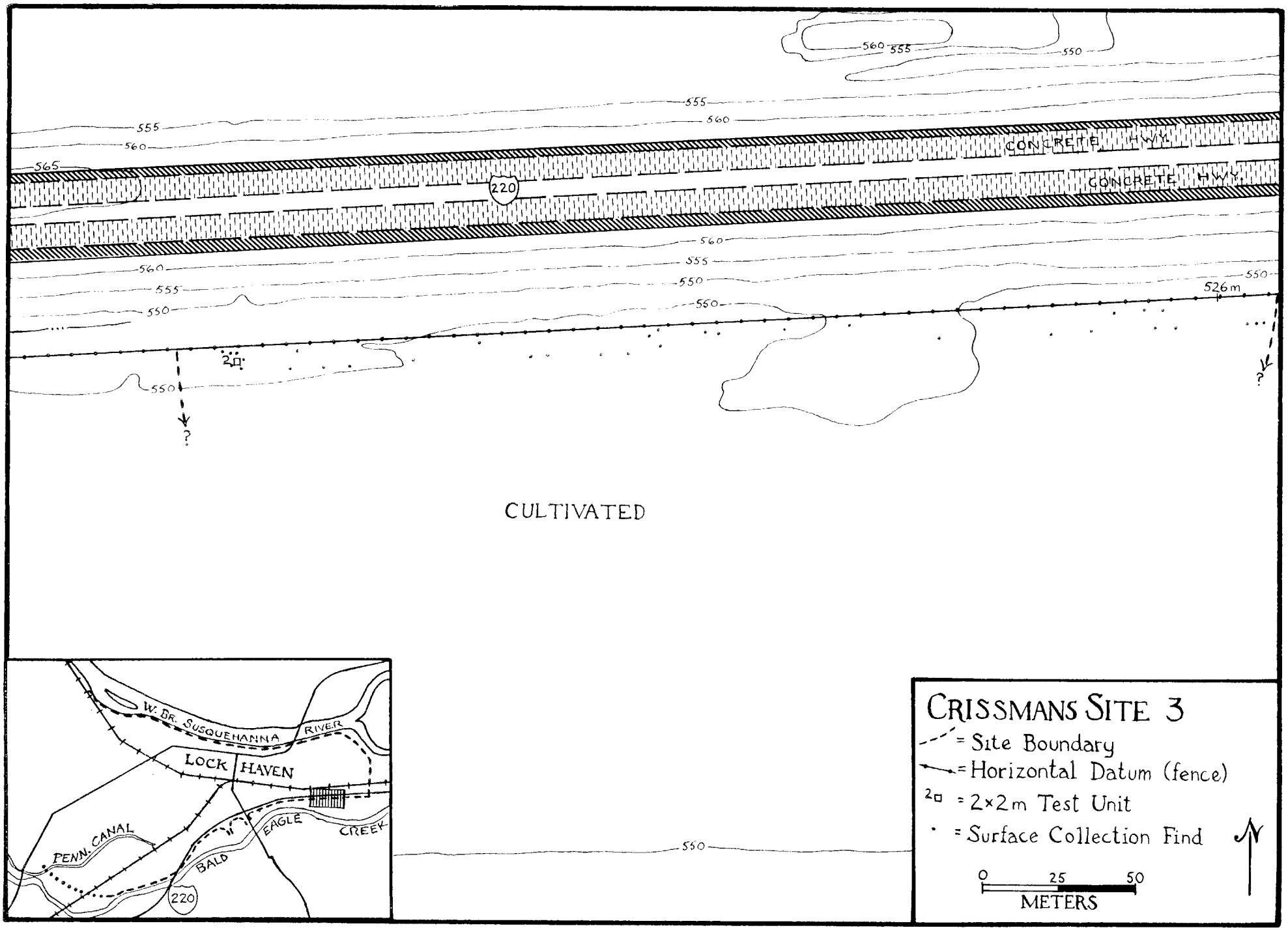

560
555
550
555
560
565
CONCRETE HWY.
220
CONCRETE HWY.
560
555
560
550
555
550
550
526m
550
?
?
CULTIVATED
W. BR. SUSQUEHANNA RIVER
LOCK HAVEN
PENN. CANAL
EAGLE CREEK
BALD
220
550
CRISSMANS SITE 3
= Site Boundary
= Horizontal Datum (fence)
2□ = 2×2m Test Unit
• = Surface Collection Find
0 25 50
METERS

Figure 6.13 Point Provenienced Artifact Find Spots and Test Unit Locations, Crissmans Site 4 (36Cn171).

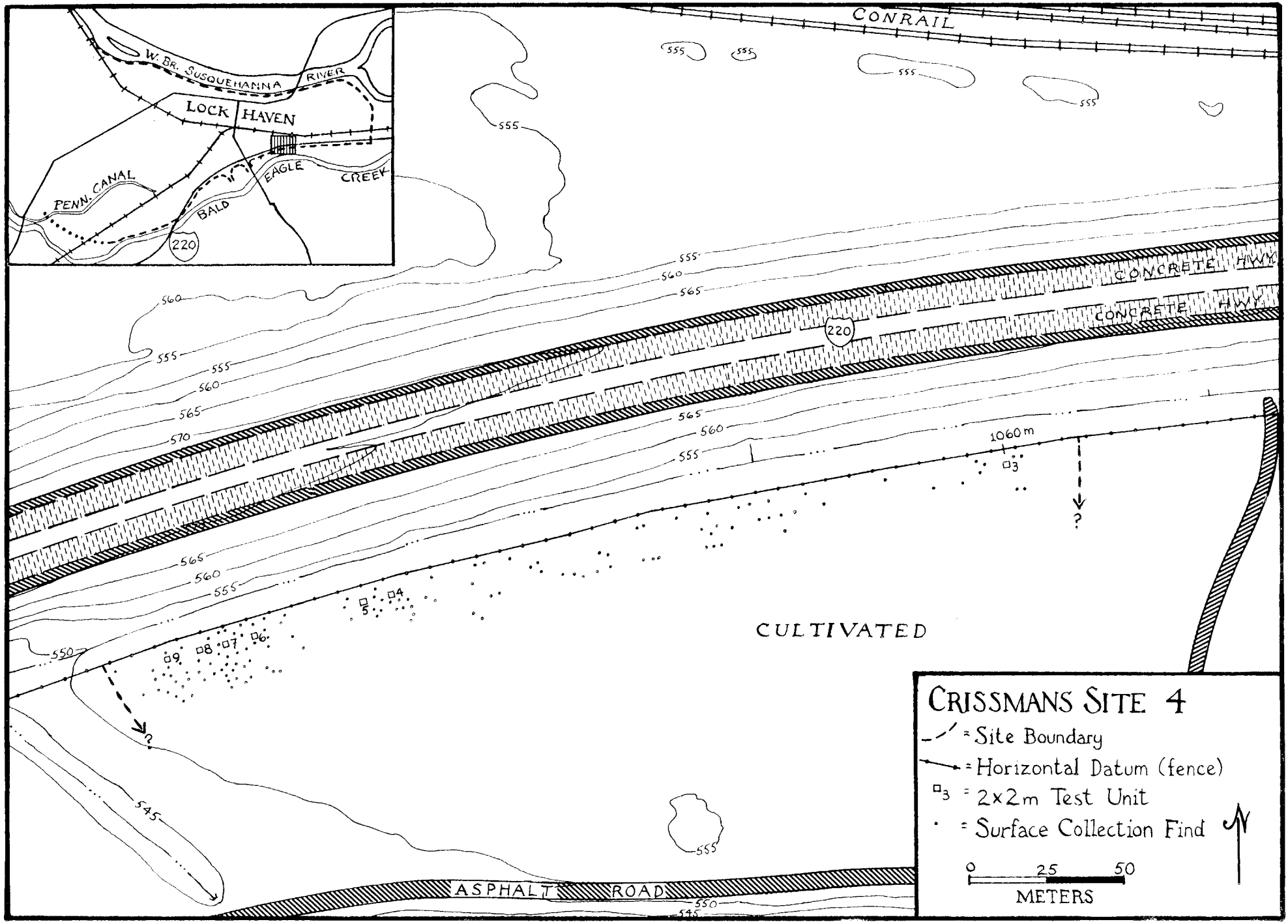
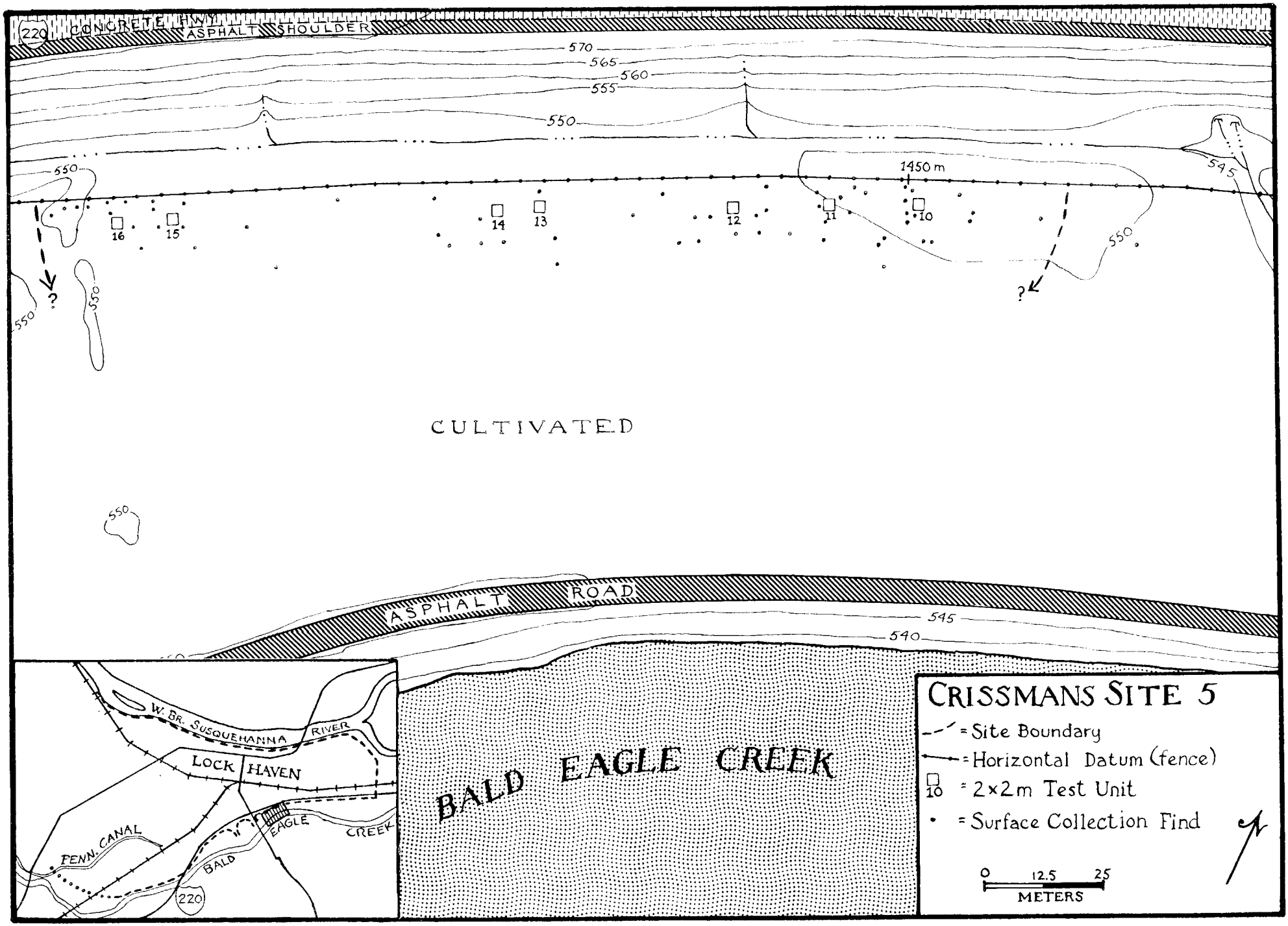

W. BR. SUSQUEHANNA RIVER
LOCK HAVEN
PENN. CANAL
BALD EAGLE CREEK
220
CONRAIL
555
560
565
570
550
545
CONCRETE HWY.
CONCRETE HWY.
220
1060 m
□3
□4
□5
□6
□7
□8
□9
?
CULTIVATED
ASPHALT ROAD
CRISSMANS SITE 4
= Site Boundary
= Horizontal Datum (fence)
□3 = 2x2m Test Unit
= Surface Collection Find
0 25 50
METERS

Figure 6.14 Point Provenienced Artifact Find Spots and Test Unit Locations, Crissmans Site 5 (36Cn172).


220
CONCRETE HWY.
ASPHALT SHOULDER
570
565
560
555
550
545
540
1450 m
16
15
14
13
12
11
10
?
CULTIVATED
ASPHALT ROAD
BALD EAGLE CREEK
W. BR. SUSQUEHANNA RIVER
LOCK HAVEN
PENN. CANAL
BALD EAGLE CREEK
220
CRISSMANS SITE 5
= Site Boundary
= Horizontal Datum (fence)
10 = 2×2m Test Unit
= Surface Collection Find
0 12.5 25
METERS

In consultation with the Baltimore District and the Pennsylvania Bureau for Historic Preservation, it was decided to focus site testing on Crissmans Sites 4 and 5 rather than on Crissmans Sites 2 and 3. Specifically, seven 2 m x 2 m (6.5' x 6.5') test pits were placed within the boundaries of the former two sites while one 2 m x 2 m (6.5' x 6.5') test pit was placed within each of the latter two sites.

Within Crissmans Sites 4 and 5, test units were placed within the areas of highest artifact density, as revealed by the Phase I survey (Figures 6.13 and 6.14). These tests were then excavated to retrieve additional artifact samples, to assess feature preservation, and to evaluate intra-site horizontal variability.

As indicated above, Crissmans Site 4 contained two areas of distinctly high artifact density, including a core area and a lesser artifact cluster to the east of the core area. To sample these areas, four test units were placed within the core area and two units were placed within the secondary artifact cluster. Finally, a single unit was placed within the low density site periphery (Figure 6.13). Within Crissmans Site 5, where three areas of high artifact density were apparent, three test units were placed within the eastern (and largest) artifact cluster and two test units each were located in the western and central clusters (Figure 6.14).

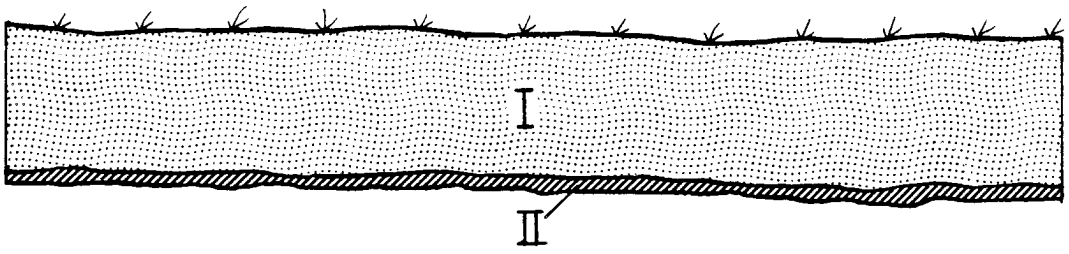
The single test units located within Crissmans Sites 2 and 3 were also located in the portions of these sites exhibiting the highest artifact densities (Figures 6.11 and 6.12). These latter pits were excavated primarily to confirm the low density character of these sites, as inferred from the Phase I survey.

Test units at all the Crissmans Field sites were laid out using the Pennsylvania Department of Transportation fence paralleling the U.S. Route 220 embankment as a measured baseline. With this approach, the easternmost post of the fence served as a horizontal datum for all four Crissmans sites. Because these sites were excavated under temporary shelters during severe winter conditions, transit readings of elevations during excavation was infeasible. For this reason, all elevations were measured from the surface of the ground at the northeast corner of each test unit. Since detailed contour maps (1' contour interval) were available, vertical datum points were not necessary to correlate these elevation readings with true elevations above mean sea level.

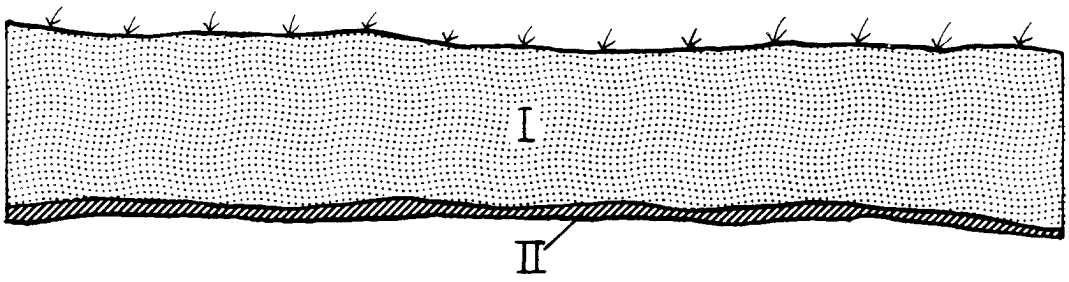
The test units located within Crissmans Sites 2-5 all revealed similar soil profiles consisting of a dark brown Ap-soil horizon extending to depths of 30 cm (12") to 60 cm (24") below the surface. Beneath the Ap-horizon was a well developed orange brown B-horizon (Figure 6.15). During excavation the Ap-horizon was removed and screened as a single provenience unit. Because the underlying B-horizon was old (i.e., of Wisconsin age or older), it was not excavated but was troweled to reveal features. No features were encountered at any of the Crissmans sites.

Figure 6.15 Typical Soil Profiles at Cummings Site 2 (36Cn169) and at Crissmans Site 4 (36Cn171).

Cummings Site 2
Unit 4, West Wall



Crissmans Site 4
Unit 6, South Wall



0 10 20 cm

The tests located within Crissmans Sites 2 and 3 confirmed the low density of artifacts at these sites. At Crissmans Sites 2, Unit 1 produced 13 artifacts, indicating an overall density of 9 artifacts/m3. At Crissmans Site 3, Unit 2 produced 18 artifacts for a density of 13 artifacts/m3. The artifacts recovered consisted exclusively of flakes of jasper, flint, chert, and rhyolite. With artifact densities this low, recovering even the most basic data concerning site age and function would involve costs incommensurate with the value of the information obtained. This result indicated that these sites were not eligible for inclusion on the National Register of Historic Places (see below, Section 8.3).

At Crissmans Site 4, different results were obtained. Test Units 6-9, which were located within the highest artifact density portion of the site, produced 45-133 artifacts per unit or 28 to 83 artifacts/m3. Included among the artifacts from these units were nine projectile points, including two Sylvan Side-Notched points, one Normanskill point, and two Late Woodland triangles. The other four points were chronologically non-diagnostic. With the exception of several tools and preforms, the remaining artifacts consisted of flakes of jasper, flint, chert, and rhyolite. These results suggested that the artifact cluster tested with Units 6-9 might produce reliable data concerning site age and function. Determination of the eligibility of this site was therefore deferred until the completion of laboratory research (see below, Section 8.4).

As indicated above, an additional artifact cluster within Crissmans Site 4 was also tested. From this cluster, Units 4 and 5 produced 51 and 55 artifacts respectively, indicating artifact densities of 43 to 46 artifacts/m3. The final unit excavated within Crissmans Site 4 was Unit 3, which was located on the low artifact density perimeter of the site. This unit produced only 6 artifacts (5 artifacts/m3), indicating that the low density peripheries of this site probably did not warrant further investigation. The artifacts from Units 4 and 5 again consisted of chronologically non-diagnostic preforms, tools, and flakes of jasper, flint, chert, and rhyolite.

At Crissmans Site 5, the easternmost artifact cluster was again characterized by low artifact densities. Units 10, 11, and 12 produced 9 to 28 artifacts/unit, or 7 to 21 artifacts/m3. The central cluster at Crissmans Site 5 also exhibited low artifact densities; Units 13 and 14 produced only 26 and 19 artifacts respectively, indicating overall artifact densities of 20 artifacts/m3 and 14 artifacts/m3. Only the westernmost cluster at Crissmans Site 5 produced moderate densities of artifacts; Units 15 and 16 produced 64 and 32 artifacts respectively, or 42 and 23 artifacts/m3. The artifacts again consisted of chronologically non-diagnostic items of jasper, flint, chert, and rhyolite. As with the higher density portions of Crissmans Site 4, further evaluation of Crissmans Site 5 was deferred until the completion of laboratory analysis (see below, Section 8.6).

Summary: The results of surface survey and site testing along the levee alignment between the Route T-375 underpass and the Castanea Township Fire Company property revealed four archaeological sites, termed Crissmans Sites 2-5. Furthermore, the results indicated that Crissmans Sites 2 and 3 and most of Crissmans Sites 4 and 5 exhibited artifact densities so low as to preclude significant information potential. Within portions of Crissmans Sites 4 and 5, however, areas exhibiting higher artifact densities were encountered. These latter areas were identified as intra-site artifact clusters, and were considered to have greater information potential than the remainder of the archaeological resources along this levee segment. Further evaluation of the sites containing these clusters was deferred until completion of laboratory analysis.

6.1.3.6 U.S. Route 220 Corridor from Hanna Street to Bald Eagle Creek, Cummings Sites 2-5 (36Cn169, 36Cn173, 36Cn174, and 36Cn175: From the western end of the cultivated field between the Route T-375 underpass and the Castanea Township Fire Company property, the levee alignment crosses the Fire Company property to the Hanna Street underpass. At this point, it turns to the south and follows the eastern berm of Hanna Street (Figure 2.2). This latter portion of the alignment lies on the lands of the Castanea Township Fire Company, to which access was denied.

Crossing Hanna Street, the alignment then follows the western berm of the street until it again reaches the U.S. Route 220 embankment, which it follows to the west. At the Jay-Street connector, tie-outs against the connector embankment interrupt the alignment; to the west of the Jay-Street connector, the alignment follows the U.S. Route 220 embankment to Bald Eagle Creek (Figure 2.2).

With the exception of two small parcels, the entirety of the alignment between Hanna Street and Bald Eagle Creek was studied during the present project. The exceptions included a small Pennsylvania Department of Transportation residual immediately to the west of the Jay-Street Connector and an area extending approximately 100' on either side of a toxic waste site located between the Jay-Street connector and Bald Eagle Creek. Access to the first of these properties was denied, while the second was excluded from study because of toxic contamination.

As with the previously described alignment segment, both Phase I site survey and Phase II site testing were conducted between Hanna Street and Bald Eagle Creek (Figure 6.16). During previous archaeological research for the Lock Haven Flood Project, one archaeological site had been identified along this alignment segment, and was termed Cummings Site 2 (see above, Section 3.4). During the present study, this site was tested to determine its eligibility for inclusion on the National Register of Historic Places. In addition, the entirety of the alignment, with the exception of the above-described parcels, was surveyed to locate undiscovered archaeological sites and to confirm the location of Cummings Site 2.

Phase I Survey: At the time of survey, the area traversed by the Hanna Street to Bald Eagle Creek alignment consisted primarily of gently undulating, generally level terrain comprising the first terrace above the Bald Eagle Creek floodplain. Near its western terminus near Bald Eagle Creek, the alignment crossed a narrow strip of level floodplain terrain at a slightly lower elevation. In various areas, the vegetation along the alignment consisted of grass, scrub, and secondary growth forest. In addition, considerable disturbance was in evidence in the form of drainageways, dumps, abandoned roadways, foundations, and a defunct recreational area.

Because the Hanna Street to Bald Eagle Creek alignment was vegetation covered, Phase I survey procedures consisted of shovel test excavation rather than pedestrian surface survey. Beginning at the eastern (Hanna Street) end of the alignment, shovel tests were excavated at 15 m (49') intervals along a single transect following the levee alignment. Along the western berm of Hanna Street and along the U.S. Route 220 embankment to the west of the Hanna Street for approximately 100 m (328'), shovel tests generally revealed a dark brown silt loam or clay loam Ap-soil horizon overlying a well-developed, orange brown clay loam B-horizon. The Ap-horizon in this area produced from one to ten prehistoric lithic artifacts per shovel test, indicating that a prehistoric archaeological site was present. The artifacts recovered consisted of flakes of jasper, chert, flint, and rhyolite as well as a single jasper side scraper. The site represented by these artifacts had not been previously recorded, and was assigned the name Cummings Site 3 (Figure 6.16).

Approximately midway between Hanna Street and the Jay-Street connector, the shovel test transect entered an area of secondary forest. In this latter area, shovel tests encountered evidence of extensive disturbance and modern dump deposits. Where shovel tests penetrated to the base of these deposits, they were underlain by B-horizon soil materials. These results indicated that the deposits in question had been placed in an artificial depression. Immediately to the west was an artificial drainageway following the eastern margin of the Jay-Street connector. Collectively, these results indicated that the area in question was disturbed and had no potential for archaeological resource preservation.

Shovel testing along the U.S. Route 220 embankment continued to the west of the Jay-Street connector, where dark brown silt loam Ap-horizon soils were again encountered overlying orange brown clay loam B-horizons. Immediately to the west of the Jay-Street connector, Cummings Site 2 was encountered in nine successive shovel tests that produced one to four prehistoric artifacts each (Figure 6.17). The artifacts recovered included flakes of jasper, chert, and flint as well as two prehistoric cord-marked body sherds. Between Cummings Site 2 and the toxic drainageway, two sterile shovel tests were excavated. To the west of the toxic drainageway, seven additional sterile shovel tests were also excavated. The eighth test, however, produced three prehistoric lithic

Figure 6.16 Shovel Test, Test Pit, and Site Locations, U.S. Route 220 Corridor from Hanna Street to Bald Eagle Creek.

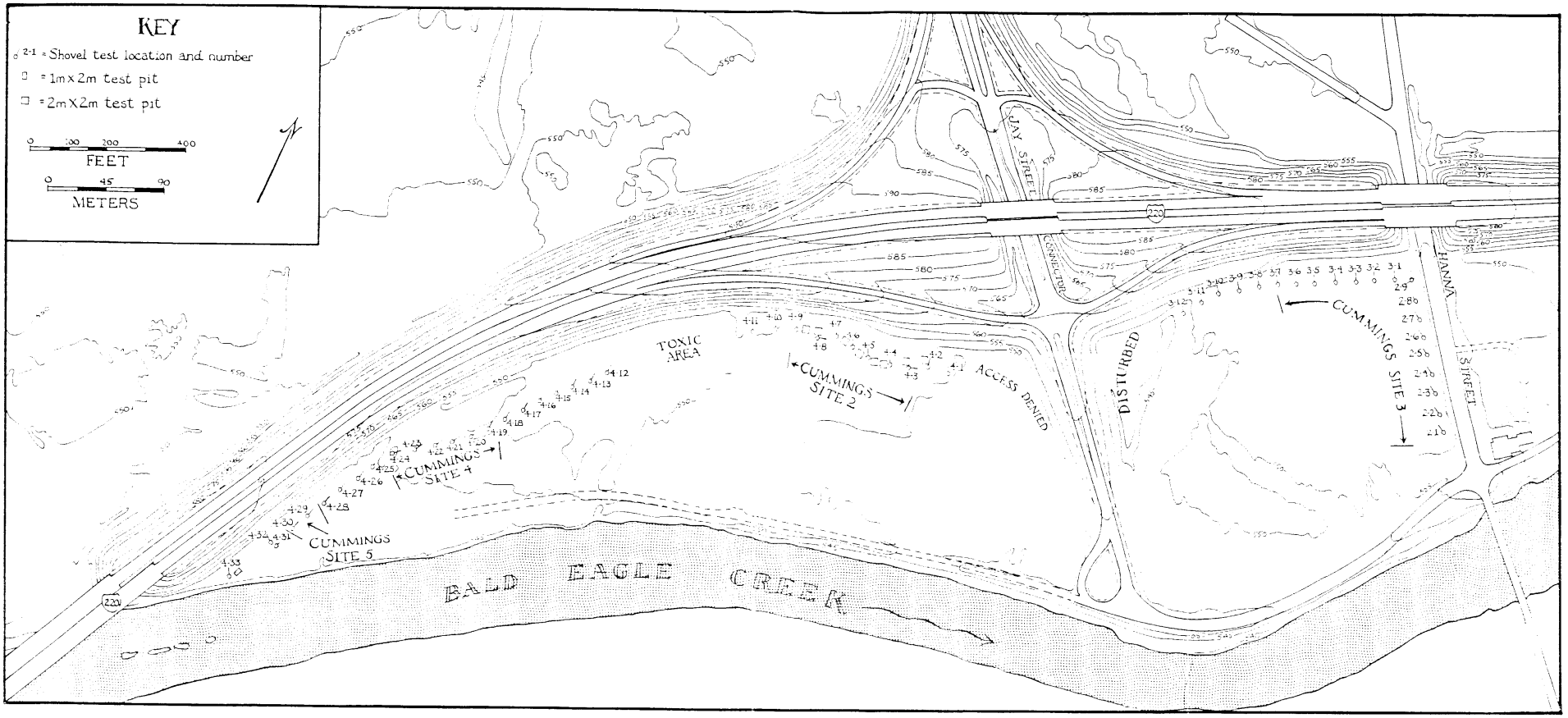
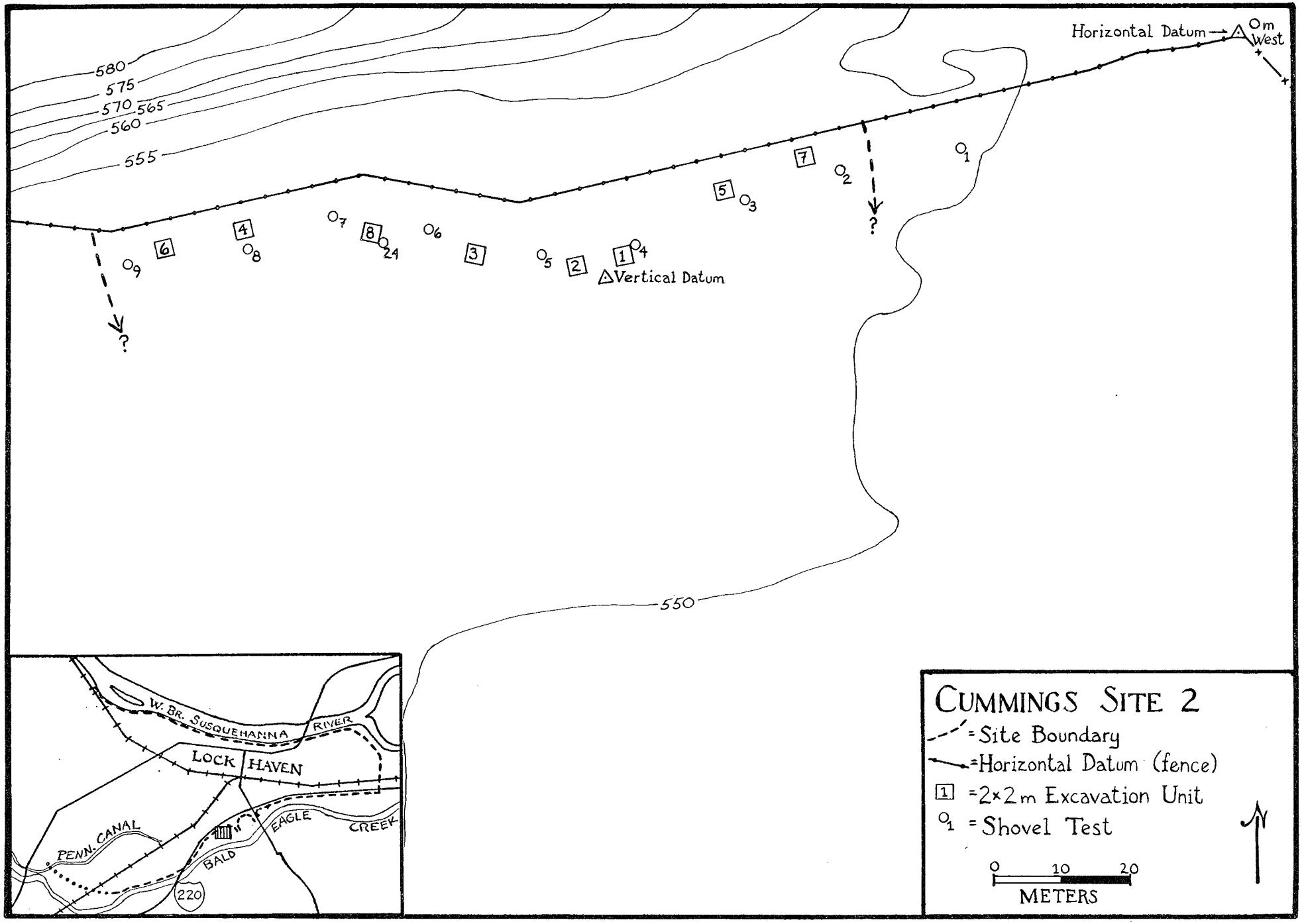

KEY
2-1 = Shovel test location and number
= 1m x 2m test pit
= 2m X 2m test pit
0 100 200 400
FEET
0 45 90
METERS
JAY STREET
220
CUMMINGS SITE 2
CUMMINGS SITE 3
CUMMINGS SITE 4
CUMMINGS SITE 5
TOXIC AREA
ACCESS DENIED
DISTURBED
HANNA STREET
BALD EAGLE CREEK

Figure 6.17 Shovel Test and Test Unit Locations, Cummings Site 2 (36Cn169).


580
575
570
565
560
555
550
Horizontal Datum
0m
West
Vertical Datum
1
2
3
4
5
6
7
8
?
?
W. Br. Susquehanna River
Lock Haven
Penn. Canal
Eagle Creek
Bald
220
CUMMINGS SITE 2
= Site Boundary
= Horizontal Datum (fence)
1 = 2x2 m Excavation Unit
O1 = Shovel Test
0 10 20
METERS

artifacts; four additional tests to the west of this latter test also produced artifacts, and indicated that another previously unrecorded site was present. The artifacts recovered included flakes of jasper, flint, chert, and rhyolite and a single piece of fire-cracked rock. The site was termed Cummings Site 4 (Figure 6.16). To the west of Cummings Site 4, three culturally sterile tests were excavated. The fourth and fifth tests, however, each produced a single prehistoric cord-marked ceramic body sherd. These tests were identified as Cummings Site 5 (Figure 6.16). Beyond Site 5, sterile shovel tests continued to Bald Eagle Creek.

Because the soil survey had revealed deep, possibly Holocene alluvium at the westernmost terminus of the U.S. Route 220 alignment near Bald Eagle Creek, a deep, 1 m x 2 m (3.3' x 3.3') test pit was excavated in this area to determine whether buried and/or stratified archaeological remains were present (Figure 6.16). This test pit was termed Unit A, and was excavated to the water table at 2.4 m (8') below the surface. The soil profile revealed by Unit A consisted of a uniform brown sandy silt throughout, with no visible stratigraphy or soil development. Sparse historic artifacts were present to a depth of 1.5 m (5') below the surface. Beneath this level, sterile deposits were found. These results suggested that the Bald Eagle Creek floodplain in the immediate area had formed recently, and did not contain prehistoric cultural remains. The historic artifacts were probably flood deposited, and thus were not in primary context.

Phase II Survey (Cummings Site 2 Only): At the completion of the shovel testing and soils surveys, site testing at Cummings Site 2 began. For this purpose, eight 2 m x 2 m (6.5/ x 6.5') test units were placed within the boundaries of the site, as indicated by the shovel test survey (Figure 6.17). These test units were located at intervals along the levee alignment, and were situated to sample the entire site area within the alignment. Test locations were laid out using a horizontal datum on the Pennsylvania Department of Transportation fence approximately 50 m (164') to the east of the site. A vertical datum was then established at an arbitrary point within the boundaries of the site, and was marked with an iron set stake.

Excavation of the Cummings Site 2 test units proceeded in the same fashion as described above for the Crissmans sites. The Ap-soil horizon was removed and screened as a single provenience unit; the underlying B-horizon was troweled to reveal features, but was not excavated.

In general, the excavations at Cummings Site 2 revealed the expected Wisconsin terrace soil profile consisting of a dark brown silt loam Ap-soil horizon extending to depths of approximately 30-35 cm (12-14"), overlying a well-developed, orange brown silty clay loam B-horizon (Figure 6.15). An exception to this generalization was encountered in Unit 8, where a dark greyish brown silt loam overlay several levels of fill containing modern and historic artifacts. The bottom-most fill level lay on an undisturbed B/C- or C-horizon soil consisting of brown, mottled clay

loam. These results indicated that in the vicinity of Unit 8, an artificial depression had been cut and had been filled in during recent times, resulting in the destruction of a small portion of Cummings Site 2.

With the exception of Unit 8, which was disturbed, the excavations at Cummings Site 2 produced prehistoric, historic, and modern artifacts. Prehistoric artifact recoveries ranged from 8 artifacts in Unit 7 (10 artifacts/m3) to 83 artifacts in Unit 4 (83 artifacts/m3). The bulk of the artifacts recovered were flakes of jasper, flint, rhyolite, and chert. Also recovered, however, were two projectile points, no other tools, and one preform. A single cord-marked ceramic body sherd was also found. The projectile points included a rhyolite blade fragment of possible Transitional age and a stemmed basal fragment of possible Late Archaic age. These results appeared to indicate that Cummings Site 2 included several prehistoric components mixed within the Ap-soil horizon. With the exception of the artificial depression described above, no features were encountered at the site.

Summary: Shovel testing along the U.S. Route 220 embankment from Hanna Street to the Bald Eagle Creek revealed four prehistoric sites. One of these was the previously recorded Cummings Site 2, which was relocated during the survey immediately to the west of the Jay-Street connector. The remaining sites (Cummings Sites 3-5) were previously undiscovered sites located at various points along the U.S. Route 220 alignment.

Phase I and II surveys at Cummings Site 2 indicated that this site consisted of a low to moderate artifact scatter contained within plow zone contexts. Prehistoric chipped stone and ceramic artifacts were present, and indicated that several prehistoric components were mixed within the artifact-bearing plow zone. No prehistoric features were found. While these results suggested that Cummings Site 2 was probably not eligible for inclusion on the National Register of Historic Places, full evaluation of the site had to await detailed artifact analyses (see below, Section 6.2).

Only Phase I testing was conducted at Cummings Sites 2-5. This testing indicated that each of these sites consisted of low to moderate density artifact scatters contained within plow zone contexts. Cummings Sites 3 and 4 produced chipped stone artifacts (flakes) only, while Site 5 produced two prehistoric body sherds.

6.1.3.7 The Bald Eagle Creek Upstream Tie Out: From the point at which U.S. Route 220 crosses Bald Eagle Creek, the levee alignment continues to the west, crosses the lands of the Hammermill Paper Company, and ties out on high ground just beyond the old Pennsylvania Canal near Frederick and Canal Streets (Figure 2.2). The alignment through the Hammermill property was not included in the present study. However, Phase I procedures were used to survey the Bald Eagle Creek upstream tie out.

At the time of survey, the Bald Eagle Creek Upstream tie out consisted of a strip of level, grass-covered terrain along the Old

Pennsylvania Canal, and gently sloping grass-covered and cultivated terrain immediately to the north. The survey of this area involved the excavation of four shovel tests and pedestrian surface survey of cultivated areas. Two shovel tests were placed within the level area near the canal, and the remaining two were situated within the sloping area to the north. A cultivated garden plot was also situated within this sloping area (Figure 6.18).

In the shovel tests located near the canal, dark greyish brown silt loams extended to depths of 25-70 cm (8-28"), and produced historic and modern artifact materials only. These dark silt loams were underlain by well developed orange brown silt loam B-horizons which were sterile of artifacts. In these tests, the water table was encountered at 35 cm (14") and 70 cm (28") respectively, thus effectively precluding deeper shovel test excavation. Auger probes were thus placed in the base of each shovel test, and indicated that normal soil profiles, extending from A-horizons into B- and B/C-horizons, were present.

The shovel tests within the sloping area revealed typical residual soil profiles consisting of 45-50 cm (18-20") of greyish brown silt loam overlying well developed orange brown compact clay loam B-horizons extending to depths of 60-70 cm (24-28"). Underlying the B-horizons were B/C- and C-horizon materials to depths of 100-120 cm (39-47"). The upper, A-horizon soils produced historic and modern artifacts only, while the underlying soil zones were sterile of artifacts.

Like the shovel tests, the surface survey of the garden plot revealed historic and modern artifacts only. Collectively, these results indicated that no potentially significant archaeological remains were present at the Bald Eagle Creek upstream tie out.

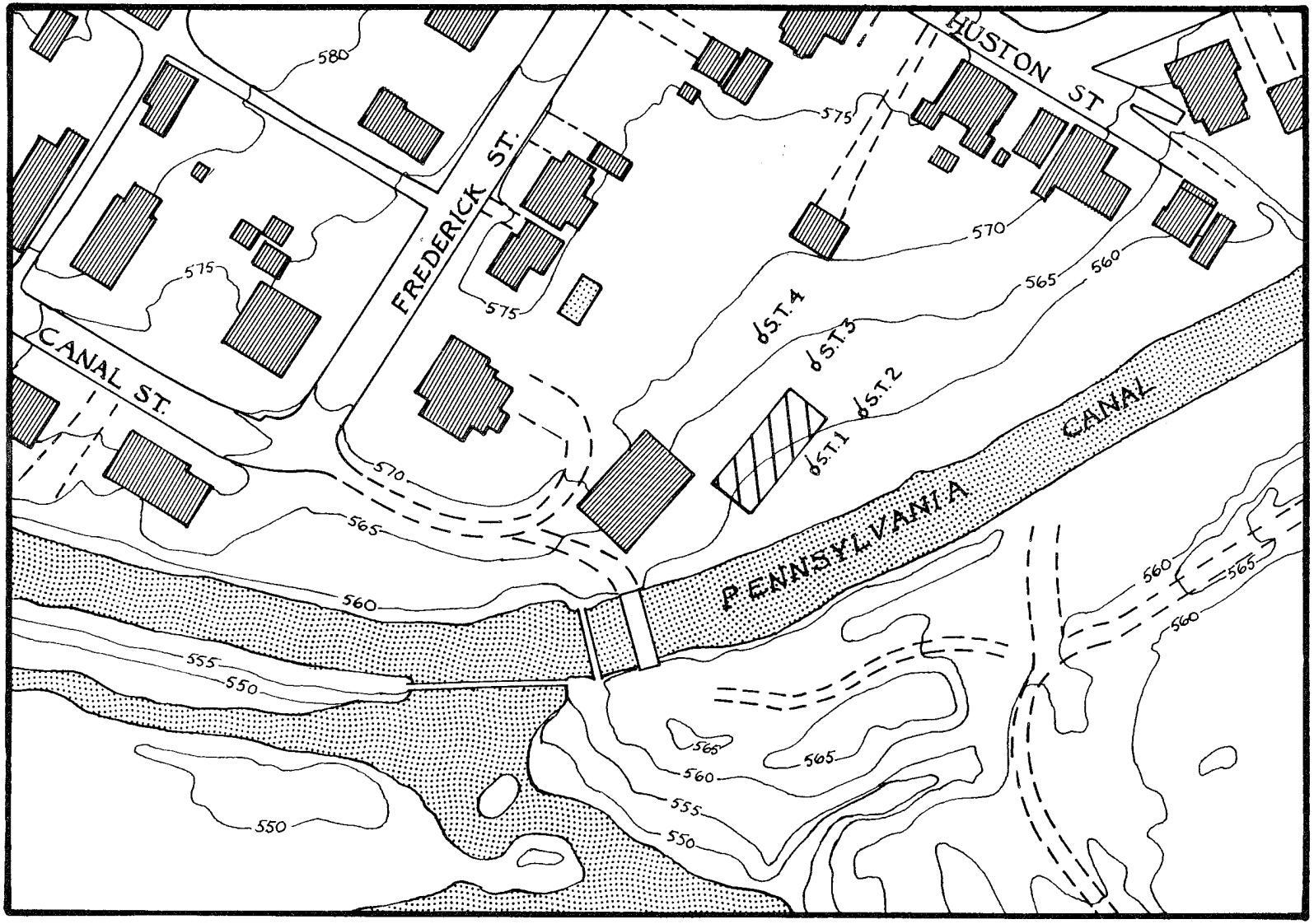
6.2 Laboratory Results

6.2.1 Introduction

At the completion of fieldwork, all artifacts recovered from the sites investigated were cleaned, catalogued, and analysed as described above (see Section 5.2). In general, laboratory analyses were conducted to further evaluate the National Register eligibility of the sites under investigation. For this purpose, the numbers of different chronologically diagnostic artifact types, lithic raw material types, and functional artifact types were tabulated. Percentages were then calculated to allow direct comparisons between assemblages from different sites, portions of sites, or levels within sites. These comparisons revealed assemblage to assemblage variability that could then be interpreted chronologically and functionally, thus providing insights into site age and function.

Most of the sites investigated in the field produced artifact assemblages that were too small to support assemblage comparisons. This result derived from the nature of the procedures used to investigate the

Figure 6.18 Areas Investigated at the Bald Eagle Creek Upstream Tie-out.



ɗS.T.1 = Shovel test

= Area surface surveyed

50 0 50 100 150 FEET

20 0 20 40 METERS

sites (e.g., Phase I survey only), the low artifact density of sites (e.g., Crissmans Sites 2 and 3), or both. Thus, Water Street Site 2, Crissmans Sites 2 and 3, and Cummings Sites 3-5 all produced total artifact samples of 51 pieces or less. These samples were considered too small to support detailed analysis. Thus, the data from these latter sites were simply tabulated and are presented herein for future reference (Tables 6.1-6.6).

Larger artifact samples, ranging from approximately 200-500 pieces, were recovered from the remaining sites investigated (Island View Site, Crissmans Sites 4 and 5, Cummings Site 2). These latter samples were considered adequate to support detailed assemblage comparisons, and were thus analysed and compared to further assess site significance. However, somewhat different considerations were relevant to significance assessments for the various sites in question. For this reason, different analytical approaches were used for different categories of sites. For example, a key concern relative to the eligibility of the Island View Site was whether or not the site contained an intact stratigraphic sequence. Laboratory analysis of materials from this site thus focused on assessing whether or not temporally sensitive changes in artifact content could be discerned in the various levels excavated at this site. In contrast, Crissmans Sites 4 and 5 as well as Cummings Site 2 consisted of plow zone lithic scatters; therefore, stratigraphy was not an issue. Instead, the significance of these sites depended primarily upon whether or not single components or special purpose occupations were present, and could provide information concerning local settlement/subsistence systems. For these latter sites, laboratory research thus focused on assessing age and function.

6.2.2 Island View Site (36Cn166)

As indicated above (see Section 6.1.3.2), excavations at the Island View Site indicated that relatively deep, potentially intact stratified deposits were present. Furthermore, the field data indicated that the upper three stratigraphic zones at the site were of historic origin, and consisted of various types of fill containing historic and modern artifacts. While these upper levels also contained prehistoric artifacts, these latter artifacts were clearly not in primary context, but instead had become incorporated into the levels in question through site disturbance, fill placement, and the like. The upper three levels at the Island View Site were therefore interpreted as an historic site component. Whether this component was significant or not depended upon the nature of the historic artifacts it contained, and whether the artifacts in question could be related, either chronologically or behaviorally, to the history of Lock Haven. Analyses of the historic artifacts recovered from the Island View Site were geared towards resolving this issue.

In addition to an historic component, field research revealed a prehistoric component at the Island View Site (see above, Section 6.1.3.2). The uppermost level that could conceivably have been a part of

Table 6.1. Prehistoric Artifacts Recovered at Water Street Site 2 (36Cn170).

	Chert	Flint	Jasper	Rhyolite	Other
Projectile Points	0	0	0	0	0
Other Tools	0	0	0	0	0
Preforms	0	0	0	0	0
Primary Trimming Flakes	1	0	0	0	0
Biface Thinning Flakes	3	2	0	0	0
Shatter	0	0	0	0	0
Ceramics	0	0	0	0	0

Table 6.2. Prehistoric Artifacts Recovered from Crissmans Site 2 (36Cnl67)[a].

	Chert	Flint	Jasper	Rhyolite	Other
Projectile Points	0	0	0	0	0
Other Tools	1	1	0	0	0
Preforms	0	0	0	0	0
Primary Trimming Flakes	0	0	0	0	0
Biface Thinning Flakes	6	2	0	0	3
Shatter	0	0	0	0	0
Ceramics	0	0	0	0	0

[a] Based on excavated artifacts only. For surface collection, see below, Section 12.2.

Table 6.3. Prehistoric Artifacts Recovered from Crissmans Site 3 (36Cn168)[a].

	Chert	Flint	Jasper	Rhyolite	Other
Projectile Points	0	0	0	0	0
Other Tools	0	1	0	0	0
Preforms	0	0	0	0	0
Primary Trimming Flakes	0	0	0	0	0
Biface Thinning Flakes	9	4	0	0	4
Shatter	0	0	0	0	0
Ceramics	0	0	0	0	1

[a] Based on excavated artifacts only. For surface collection, see below, Section 12.2.

Table 6.4. Prehistoric Artifacts Recovered from Cummings Site 3 (36Cn173).

	Chert	Flint	Jasper	Rhyolite	Other
Projectile Points	0	0	0	0	0
Other Tools	1	1	0	0	1
Preforms	1	2	0	0	0
Primary Trimming Flakes	1	2	1	0	0
Biface Thinning Flakes	14	3	3	3	3
Shatter	4	0	0	0	0
Ceramics	0	0	0	0	0

Table 6.5. Prehistoric Artifacts Recovered from Cummings Site 4 (36Cnl74).

	Chert	Flint	Jasper	Rhyolite	Other
Projectile Points	0	0	0	0	0
Other Tools	0	0	0	0	1
Preforms	0	0	0	0	0
Primary Trimming Flakes	4	0	0	0	0
Biface Thinning Flakes	2	1	1	2	0
Shatter	0	0	0	0	0
Ceramics	0	0	0	0	0

Table 6.6. Prehistoric Artifacts Recovered from Cummings Site 5 (36Cnl77).

	Chert	Flint	Jasper	Rhyolite	Other
Projectile Points	0	0	0	0	0
Other Tools	0	0	0	0	0
Preforms	0	0	0	0	0
Primary Trimming Flakes	0	0	0	0	0
Biface Thinning Flakes	0	0	0	0	0
Shatter	0	0	0	0	0
Ceramics	0	0	0	0	2

this component was Zone IV, a buried A-horizon soil containing both historic and prehistoric artifacts. This zone was interpreted as perhaps representing the original land surface at the time of first Euro-American settlement in the area--a surface that may also have been occupied by native American groups prior to Euro-American settlement. Underlying Zone IV was Zone V, a thick deposit which contained prehistoric artifacts throughout, but which failed to exhibit natural stratigraphy. Zone V was therefore excavated in a series or arbitrary 5-cm (2") and 10-cm (4") levels, termed Zone V, Levels 1-6. Together Zone IV and V were identified as a prehistoric component at the Island View Site.

A key issue regarding the eligibility of the Island View Site for inclusion on the National Register of Historic Places was whether the prehistoric component at the site, encompassed by Zone IV and Zone V, Levels 1-6 contained an intact, culturally stratified sequence of occupational zones or components that would reflect changes in artifact style and material culture through prehistoric time. The primary object of prehistoric artifact analysis, including projectile point typology, ceramic artifact identification, and lithic raw material composition analysis, was to determine whether or not the prehistoric component at this site exhibited such stratigraphic integrity.

6.2.2.1 Projectile Points: During the excavations at the Island View Site, 29 projectile points or projectile point fragments were recovered. Of these, 7 were considered sufficiently intact to be assigned to types or periods. These latter points included Brewerton Side-Notched, Sylvan Side-Notched and Stemmed, Jacks Reef Pentagonal, and Late Woodland triangular points, representing occupation of the site from Early Late Archaic through Late Woodland times (Plate 6.3).

To address the issue of stratigraphic integrity within the prehistoric levels of the Island View Site, the distribution of these typed projectile points within the stratigraphic sequence exhibited by the site was examined. Largely due to small sample sizes, the results of this analysis were generally inconclusive. Within Unit 1, two potentially diagnostic projectile points were discovered near the bottom of the sequence. Of these, one was identified as a Sylvan Side-Notched point while the other was a Brewerton Side-Notched point, both of Late Archaic age. This result indicated that the lowest artifact-bearing zone in Unit 1 was probably of Late Archaic date.

Within Unit 2, a Sylvan Side-Notched point was discovered near the top of the prehistoric sequence, while Brewerton Corner Notched and Sylvan Stemmed (both Late Archaic) points were found in a level near the middle of the sequence. Underlying this latter level was a level that produced a Jacks Reef Pentagonal point (Early to Middle Woodland) and a thick triangular point, tentatively identified as an unfinished Late Woodland point. While sample sizes were small, the presence of Late Archaic materials in stratigraphic positions above Woodland materials suggested that a mixed or disturbed sequence was present.

Plate 6.3 Selected Projectile Points from the Island View Site (36Cn166)

Top Row Left	:	Adena Stemmed, grey chert
Top Row Right	:	Late Woodland Triangle, black chert
Second Row Left	:	Brewerton Side-Notched, jasper
Second Row Center	:	Sylvan Side-Notched, grey chert
Second Row Right	:	Sylvan Stemmed, grey chert
Third Row Left	:	Brewerton Side-Notched, grey chert
Third Row Right	:	Brewerton Corner-Notched, grey chert


0
5cm

In Unit 3, a single point tentatively identified as an Adena point of Early Woodland age was recovered from from Zone III, a disturbed level. This result was again inconclusive.

6.2.2.2 Prehistoric Ceramic Artifacts: Analysis of the stratigraphic distribution of the prehistoric ceramic artifacts recovered from the Island View Site provided additional insights into site integrity. From Unit 1, 87 sherds were recovered, including 85 body sherds and 2 rim sherds. One rim sherd was identified as Shenks Ferry Incised, while the other was identified as Levanna Cord-on-Cord, an Owasco and Clemson Island type (Plate 6.4). Both rims were found in the uppermost prehistoric level encountered in Unit 1.

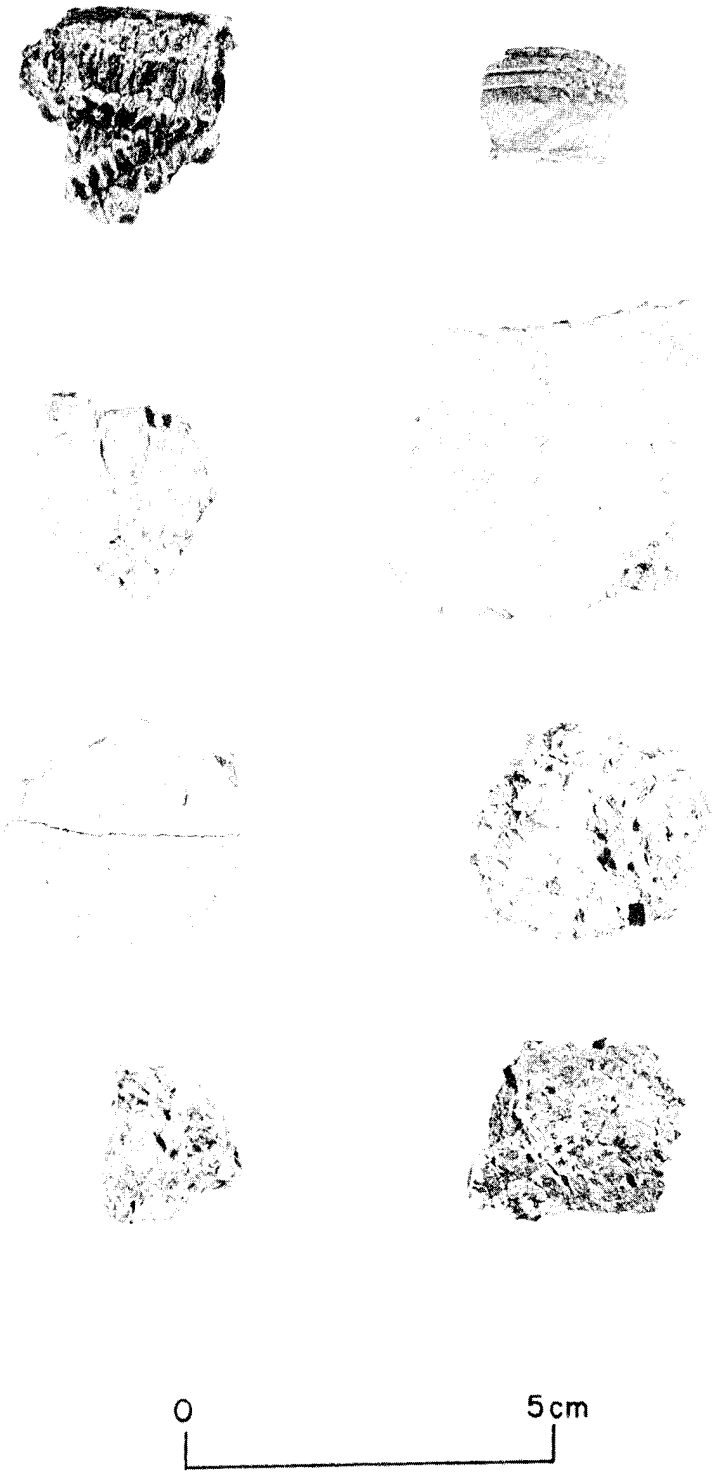
While the body sherds recovered from Unit 1 were in a strict sense temporally diagnostic only of the Woodland Period, they consisted almost exclusively of relatively thin, well-fired, crushed-chert tempered, cord-marked sherds typical of the Middle and Late Woodland Periods. These sherds were recovered from the upper three prehistoric levels (Zone IV and Zone V, Levels 1 and 2) in Unit 1. In the fourth level, three additional sherds were discovered, and included two poorly fired, sand tempered body sherds typical of Early Woodland ceramics and a fragment of a steatite bowl, generally assumed to be Transitional in age. Below the fourth prehistoric level (Zone V, Level 3), only lithic artifacts were present, and extended to the base of the prehistoric sequence.

Collectively, the diagnostic artifacts from Unit 1, including both ceramics and projectile points, indicated that an intact chronological sequence of prehistoric artifacts was present within Zones IV and V. The uppermost levels (Zones IV and V, Levels 1 and 2) produced Middle and Late Woodland ceramic materials, and were underlain by a level (Zone V, Level 3) that produced Early Woodland and Transitional artifacts. Below this latter level were pre-ceramic deposits (Zone V, Levels 4-6), presumably of Archaic age, extending to the base of the sequence where several Late Archaic projectile points were discovered.

In contrast to Unit 1, the prehistoric ceramic artifacts from Unit 2 provided further evidence of disturbance and/or mixing. Specifically, Zone V Level 2 produced two typical Middle to Late Woodland body sherds; these sherds were stratigraphically below a Late Archaic Sylvan Side-Notched point from Zone IV. Furthermore, Zone V Level 4, which was in the middle of the Unit 2 prehistoric sequence, produced four typical Middle to Late Woodland body sherds. This same level produced Late Archaic materials in the form of Sylvan Stemmed and Brewerton Corner-Notched points. Finally, Zone V Level 5 produced an additional body sherd in association with the above-mentioned Jacks Reef and triangular projectile points. As with the projectile point data, these results indicated that younger materials were frequently in stratigraphic positions below older materials--a result indicative of considerable site disturbance.

Plate 6.4 Selected Prehistoric Ceramics from the Island View Site (36Cn166) and Cummings Site 2 (36Cn169).

Top Row Left	:	Levanna Cord-on-Cord, rim sherd
Top Row Right	:	Shenks Ferry Incised, rim sherd
Second Row Left	:	Cord Marked, grit tempered, body sherd
Second Row Right	:	Cord Marked, grit tempered, body sherd
Third Row Left	:	Cord Marked, grit tempered, body sherd
Third Row Right	:	Plain, grit tempered, body sherd
Fourth Row Left	:	Cord Marked, grit tempered, body sherd
Fourth Row Right	:	Cord Marked, grit tempered, body sherd


0
5cm

The ceramic artifacts from Unit 3 exhibited still other distributional characteristics. In contrast to Unit 1, which produced 87 ceramic pieces, Unit 3 produced only prehistoric three sherds, all from upper levels (Zone V, Levels 1 and 2) in the prehistoric stratigraphic sequence. This result suggested that in Unit 3, the upper ceramic-bearing portion of the prehistoric sequence had been removed as a result of site disturbance, perhaps during the period when the Island View Park vicinity was the site of residential housing. The presence of an Early Woodland Adena point near the top of the Unit 3 sequence was consistent with this interpretation. Since no diagnostic artifacts were recovered from the lower portions of the Unit 3 sequence, its integrity was assessed using other data.

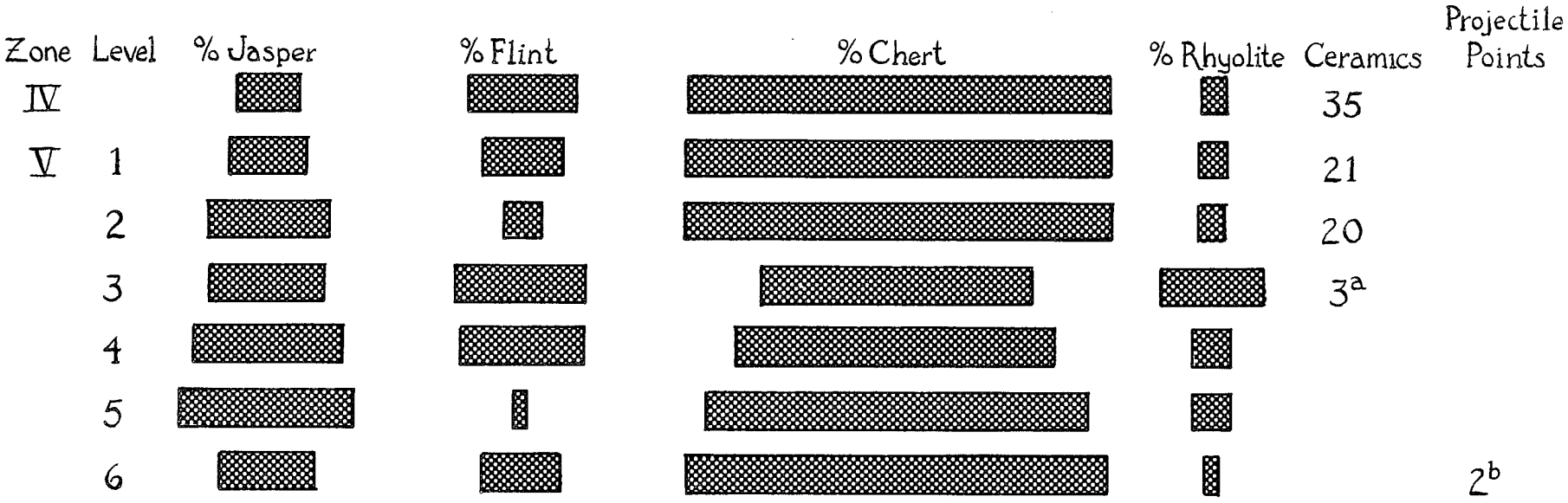
6.2.2.2 Lithic Raw Material Composition: Recent archaeological research in central Pennsylvania as well as in other portions of the eastern woodlands has demonstrated that systematic changes in lithic raw material utilization occurred during prehistoric times (Snavely n.d., Hay and Stevenson 1984, Hay and Beckerman 1985). It follows that intact stratigraphic sequences of archaeological components should show systematic changes in lithic raw material composition. On the basis of this assumption, the lithic raw materials contained in the various levels excavated at the Island View Site were examined to determine whether consistent, chronologically interpretable changes were apparent. If present, such changes were taken as additional evidence of intact stratigraphy within the site.

To investigate variability in lithic raw material composition, the percentages of each of four general raw material types were calculated for each zone and level excavated within the prehistoric portion of the Island View Site. These types were simplified through collapsing the color phases of flint and chert and were analyzed by types to include jasper, flint, chert, and rhyolite. The results were then displayed as bar graphs to reveal systematic changes in lithic raw material composition (Figures 6.19-6.20), and provided substantial confirmation of the results derived from diagnostic artifacts. Within Unit 1, three out of four raw material types exhibited systematic changes throughout the stratigraphic sequence. Beginning at the base of the sequence, jasper increased in prevalence to an early peak and then gradually declined in prevalence to the top of the sequence. In contrast, chert decreased in prevalence to approximately the middle of the sequence, and then increased. Rhyolite showed the inverse pattern, and increased to a peak at the middle of the sequence and then steadily decreased to its top (Figure 6.19). Interestingly, the rhyolite peak occurred in Zone V Level 3, which also produced the Early Woodland, sand-tempered sherd and the Transitional steatite sherd. Several lines of evidence thus indicated that this level represented an intact Transitional and Early Woodland component.

In contrast to Unit 1, Unit 2 exhibited few systematic changes in lithic raw material composition. Chert exhibited an early peak, sudden

Figure 6.19 Lithic Raw Material Composition and Chronologically Diagnostic Artifacts from Unit 1, Island View Site (36Cn166).

UNIT 1



a ~ Includes 1 Steatite Sherd
b ~ 1 Brewerton Side Notched
~ 1 Sylvan Side Notched

▒ = 10 %

decline, and subsequent gradual increase in prevalence. For the other raw material types, however, level to level variations in raw material prevalence appeared to be essentially random (Figure 6.20). Particularly noticeable was the lack of a clear rhyolite peak at any point within the sequence--a peak that would be expected if intact Transitional and/or Early Woodland components were present. Collectively, these results supported the evidence provided by diagnostic artifacts, which indicated substantial artifact mixing within the Unit 2 sequence.

The results for Unit 3 again stood in contrast with those for Units 1 and 2. In contrast to Unit 2, systematic changes in raw material composition were apparent. However, these changes differed considerably from those exhibited by Unit 1. In particular, jasper and flint increased and then slightly decreased in prevalence, chert systematically decreased in prevalence, while rhyolite was absent from the lower levels, but increased systematically from the middle of the sequence upwards (Figure 6.21).

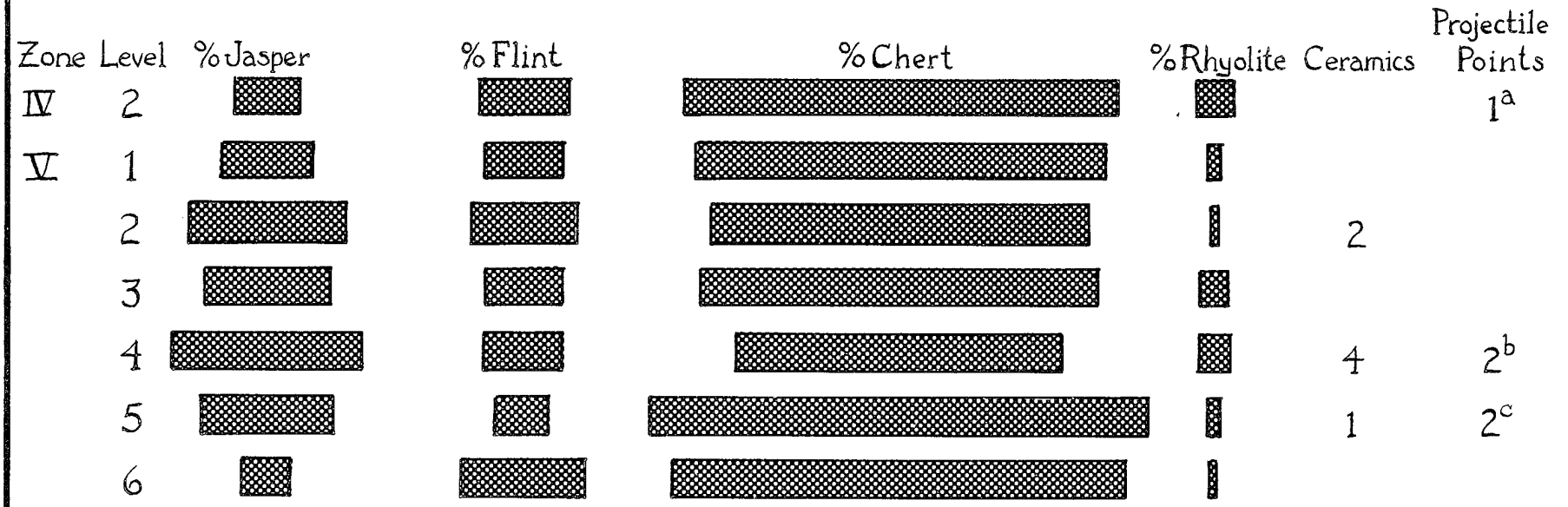
While the patterning exhibited by the Unit 3 sequence differed superficially from that of Unit 1, an interesting similarity between the two sequences emerged in the light of the hypothesis that the upper, ceramic bearing portions of the Unit 3 sequence had been removed through site disturbance. When the Unit 3 sequence was compared to only the lower portions of the Unit 1 sequence, similar patterns emerged. In Unit 3 and in the lower half of Unit 1, jasper increased and then decreased in prevalence, chert decreased in prevalence throughout, and rhyolite increased in prevalence (Figures 6.19 and 6.21). These similarities provided support for the hypothesis that the upper portions of the Unit 3 sequence had been removed, but that the lower portions remained intact.

6.2.2.4 Historic Artifacts: As with the prehistoric component, the stratigraphic integrity of the historic component at the Island View Site was evaluated. For this latter purpose, the historic artifacts recovered from the upper, historic levels within the site were identified by general period of manufacture (i.e., pre-modern, modern, and non-diagnostic) and were then tabulated by stratigraphic Zone (Table 6.7). The results revealed significant admixture of modern artifacts throughout the upper levels of the site--a result that clearly indicated lack of stratigraphic integrity within the historic component. The upper levels of the site were therefore interpreted as consisting of disturbed historic fill with little information potential.

Interestingly, the analysis of historic artifacts also had implications concerning the integrity of the prehistoric levels at the site. For example, in Unit 2, significant numbers of historic artifacts were recovered from levels that had originally been thought to be prehistoric, i.e., Zone V. This result provided additional evidence of disturbance within Unit 2. In contrast, no significant historic admixture was present below Zone IV in Unit 1 or Unit 3 (Table 6.7).

Figure 6.20 Lithic Raw Material Composition and Chronologically Diagnostic Artifacts from Unit 2, Island View Site (36Cn166).

UNIT 2

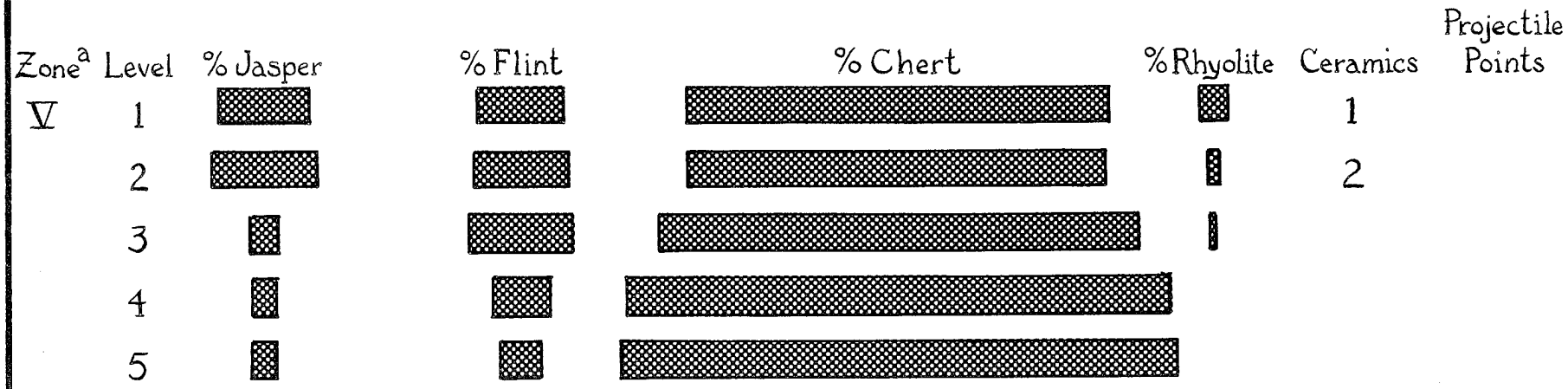


a ~ Sylvan Side Notched
b ~ Brewerton Corner Notched
~ Sylvan Stemmed
c ~ Jacks Reef Pentagonal
~ Thick Triangle

= 10 %

Figure 6.21 Lithic Raw Material Composition and Chronologically Diagnostic Artifacts from Unit 3, Island View Site (36Cn166).

UNIT 3



a ~ Zone IV excluded as possibly disturbed.

= 10 %

Table 6.7. Pre-modern, Modern, and Non-diagnostic Historic Artifacts from the Island View Site (36Cn166).

	Unit 1						Unit 2						Unit 3						Total					
	Pre Modern		Modern		Non-diagnostic		Pre Modern		Modern		Non-diagnostic		Pre Modern		Modern		Non-diagnostic		Pre Modern		Modern		Non-diagnostic	
Zone	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]	No.	%[a]
I	14	18	36	47	26	34	5	13	20	52	13	34	8	38	0	0	13	62	27	20	56	42	52	38
II	121	37	43	13	162	50	11	18	21	35	28	47	30	50	4	7	26	43	162	41	68	15	216	48
III	NA[b]		NA[b]		NA[b]		NA[b]		NA[b]		NA[b]		6	55	0	0	5	46	6	54	0	0	5	46
IV	2	9	0	0	21	91	9	8	18	16	88	77	NA[b]		NA[b]		NA[b]		11	8	18	17	109	80
V	0	0	0	0	0	0	12	75	0	0	4	25	1	0	0	0	0	0	13	77	0	0	4	24
TOTAL	137	32	79	19	209	49	37	16	59	26	133	58	45	48	4	4	44	47	219	29	142	19	386	52

[a] Percentages by pit by level.

[b] Not applicable.

6.2.2.5 Island View Site (36Cn166)--Summary of Laboratory Research Results: Collectively, the analyses of projectile points, ceramic artifacts, and lithic raw material composition provided internally consistent and mutually corroborative data concerning the integrity of the prehistoric deposits at the Island View Site. Within Unit 1, all three analyses indicated that an intact stratigraphic sequence spanning Late Archaic through Late Woodland times was present. In contrast, the same analyses were consistent in indicating that Unit 2 contained mixed or disturbed deposits. Finally, Unit 3 appeared to contain an intact sequence that correlated with the lower half of the Unit 1 sequence; presumably, the upper portions of the Unit 3 sequence had been destroyed by previous earth-moving activities at the site.

In contrast to the prehistoric component, the historic component at the site was clearly disturbed, and exhibited little or no stratigraphic integrity.

6.2.3 Crissmans Site 4 (36Cn171)

When compared to the Island View Site, excavations at Crissmans Site 4 revealed a significantly different depositional context (see above, Section 6.1.3.5). Unlike the Island View Site, Crissmans Site 4 exhibited no stratigraphy, but was instead contained entirely within disturbed plow zone contexts. Furthermore, the site produced no potentially significant historic period remains. Under these circumstances, considerations relating to National Register eligibility concerned the prehistoric component at the site, with important concerns being whether or not the site was single- or multi-component, and whether or not a functionally distinctive assemblage was present. Analyses of the artifacts recovered from Crissmans Site 4 were designed to address these two issues. These analyses included identifying chronologically diagnostic artifacts, tabulating lithic raw material assemblage composition, and analysing assemblage functional characteristics.

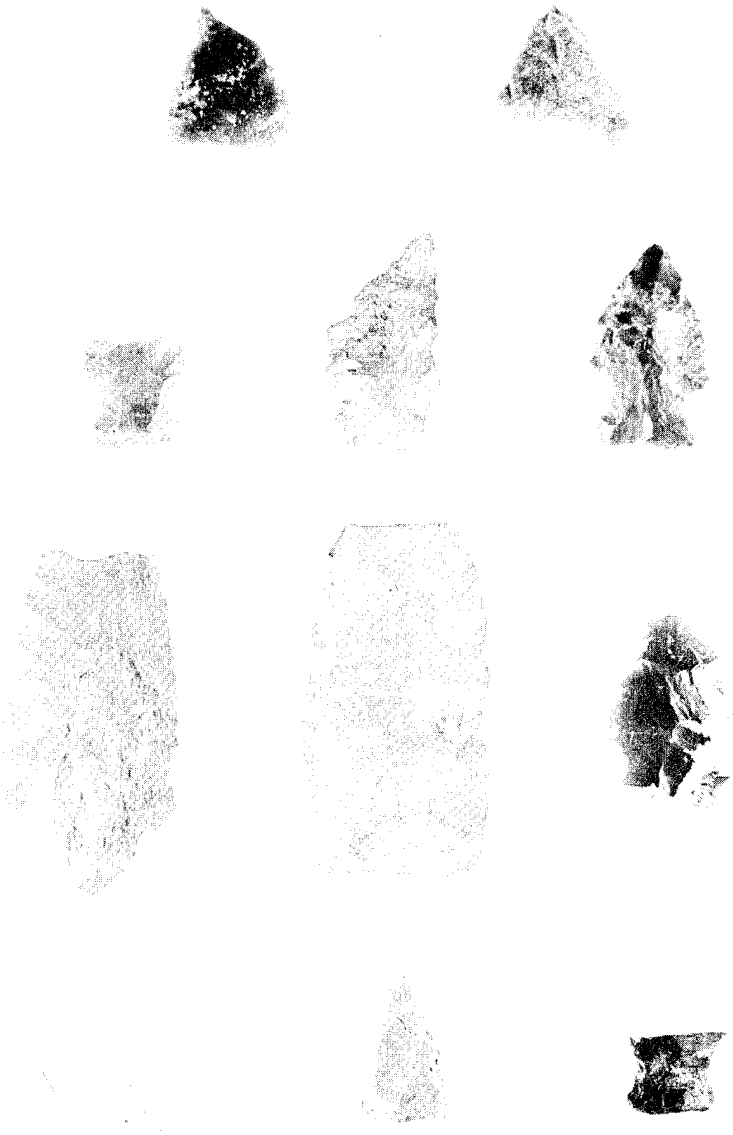
6.2.3.1 Diagnostic Artifacts: Fourteen projectile points and point fragments were recovered from Crissmans Site 4. Of these artifacts, seven could be identified as to type and general age. These included two Late Archaic Sylvan Side-Notched points, one Late Archaic Normanskill Point, one possibly Early Woodland Adena-like point, and three Late Woodland triangular points (Plate 6.5).

These results indicated that Crissmans Site 4 included several components dating to Late Archaic, perhaps Early Woodland, and Late Woodland times. Considering the small size of projectile point sample from the site, it was likely that other components were present as well.

As indicated above (see Section 6.1.3.5), Crissmans Site 4 included two distinct artifact clusters--a primary cluster representing the core area of the site and a secondary cluster just to the east. Tabulating the projectile points from the site by these two clusters indicated that of

Plate 6.5 Selected Projectile Points from Crissmans Site 4 (36Cn171).

Top Row Left	:	Late Woodland Triangle, grey flint
Top Row Right	:	Late Woodland Triangle, grey chert
Second Row Left	:	Normanskill; grey chert
Second Row Center	:	Sylvan Side-Notched, grey chert
Second Row Right	:	Sylvan Side-Notched, black chert
Third Row Left	:	Adena-like, grey chert
Third Row Center	:	Untyped, argilite
Third Row Right	:	Untyped, black flint
Fourth Row Left	:	Late Woodland Triangle, white chert
Fourt Row Center	:	Unidentified, grey chert
Fourth Row Right	:	Unidentified, black chert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5 cm

the seven typeable points, six were from the core area of the site, and again represented several components, including Late Archaic, possibly Early Woodland, and Late Woodland. Only one point, a Late Woodland triangle, was recovered from the secondary cluster, indicating that a Late Woodland occupation was present.

6.2.3.2 Lithic Raw Material Assemblage Composition: As discussed above (see Section 6.1.4.2), recent research in central Pennsylvania indicated that patterns of lithic raw material utilization changed during prehistoric times. Research conducted during the present project at the Island View Site provided additional confirmation of this view. For this reason, analyses were conducted of lithic raw material composition at Crissmans Site 4. These analyses were conducted to supplement the results provided by diagnostic artifacts.

In addition to providing information concerning site age, the lithic raw material data had the potential to address issues of site function. For example, several functions of the intra-site artifact clusters at Crissmans Sites 4 could be envisioned. One possible function was that these clusters represented single episode chipping events. If this latter hypothesis was correct, a predominance of a single lithic raw material type within the cluster in question would be expected. Thus, the lithic raw material data were examined to assess functional implications as well as chronological ones.

For the purposes of analysing the lithic raw material composition, numbers and percentages of chipped stone artifacts were calculated for the four most prevalent raw material types, including chert, flint, jasper, and rhyolite. The results indicated that all four raw material types were present in the Crissmans Site 4 lithic assemblage, with chert most prevalent (57%) followed by flint 32%), jasper (8%), and rhyolite (4%; Table 6.8). The implications of these findings were assessed through comparisons with the artifact assemblages recovered from Crissmans Site 5 and Cummings Site 2 (see below, Sections 6.2.6.2).

6.2.3.3 Assemblage Functional Characteristics: A final dimension of variability was evaluated for Crissmans Site 4, and involved assessing the functional characteristics of artifact assemblages recovered from the site. This investigation was designed to reveal whether the site possessed distinctive functional characteristics that would require further study.

For this purpose, analysis focused on the chipped stone tools from the site. While other types of tools were recovered, including several ground stone tools, these latter tool types were not sufficiently numerous to support numerical analysis.

To assess site function, the chipped stone tools from the site were tabulated using six basic tool categories, including projectile points, other chipped stone tools, preforms, primary trimming flakes, biface

Table 6.8 Lithic Raw Material Composition, Crissmans Site 4 (36Cn171), Crissmans Site 5 (36Cn172), and Cummings Site 2 (36Cn169)[a].

Lithic Raw Materials	Crissmans Site 4		Crissmans Site 5		Cummings Site 2	
	No.	%	No.	%	No.	%
Chert	270	57	103	60	166	66
Flint	152	32	80	44	64	25
Jasper	37	8	1	1	8	7
Rhyolite	17	4	0	0	4	2
TOTALS	476		184		252	

[a] Based on excavated artifacts only. Surface samples excluded as biased in favor of larger pieces.

thinning flakes, and shatter. To create these categories, some variability in the original data had to be collapsed. For example, other tools included a variety of more specific types that were distinguished during original data recording, including drills, side-scrapers, and end-scrapers. This procedure was necessary to make the data comparable to that available from other sites in central Pennsylvania.

The results of the above-described analysis indicated that, as is generally the case, biface thinning flakes comprised the majority (95%) of the artifacts recovered from Crissmans Site 4 (Table 6.9). Next in prevalence were projectile points (3%), primary trimming flakes (1%), and shatter (1%). No preforms or other tools were found. The implications of these results were more fully assessed through comparisons with other assemblages (see below, Section 6.2.6.3).

6.2.4 Crissmans Site 5 (36Cn172

Like Crissmans Site 4, Crissmans site 5 was contained entirely within a disturbed plow zone and produced no potentially significant historic remains (see above, Section 6.1.3.5). Thus, considerations relating to National Register eligibility again concerned site age and function. Analyses of the artifacts recovered from the site were designed to address these two issues, and again included identifying chronologically diagnostic artifacts, tabulating lithic raw material assemblage composition, and analysing assemblage functional characteristics.

6.2.4.1 Diagnostic Artifacts: Four projectile points and point fragments were recovered from Crissmans Site 5. Of these, three could be assigned to types, and included one Late Archaic Sylvan Side-Notched point and two Late Woodland triangles (Plate 6.6). Thus, two distinct components were represented. Considering the size of the sample, additional components were probably present at this site as well. Since each of the three typeable points from this site came from a different artifact cluster, whether or not these clusters contained several components remained unclear, based on projectile point data alone.

6.2.4.2 Lithic Raw Material Assemblage Composition: Analysis of the lithic raw materials in the Crissmans Site 5 assemblage was conducted as described above for Crissmans Site 4. In general, the results were similar. Chert was again the most prevalent material (60%) followed by flint (44%), and jasper (1%). Unlike Crissmans Site 4, no rhyolite was recovered from Crissmans Site 5 (Table 6.8).

6.2.4.3 Assemblage Functional Characteristics: Like Crissmans Site 4, biface thinning flakes were again the predominant artifact type (76%) at Crissmans Site 5, followed by primary trimming flakes (21%), projectile points (2%), and shatter (1%). Preforms and other tools were not found (Table 6.9).

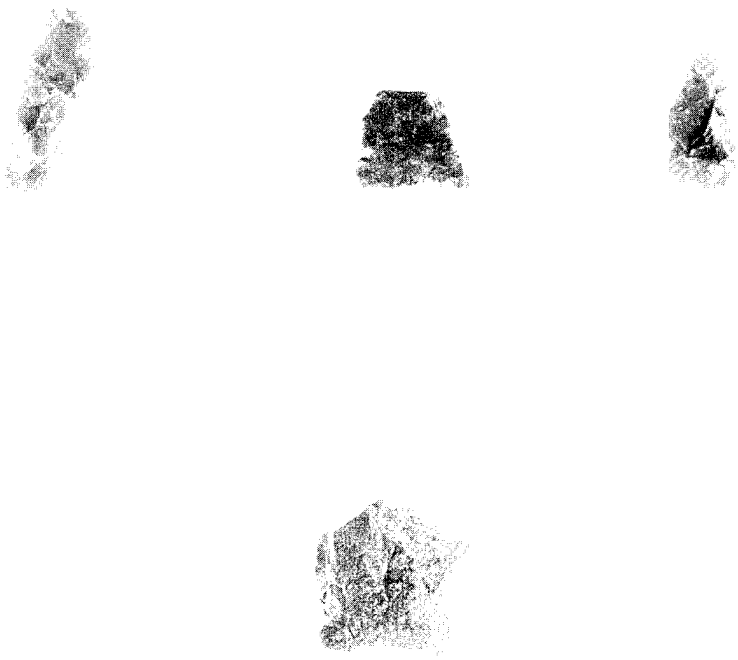
Table 6.9 Chipped Stone Artifacts from Cummings Site 2 (36Cn169), Crissmans Site 4 (36Cn171), and Crissmans Site 5 (36Cn172)[a].

Artifact Type	Crissmans Site 4		Crissmans Site 5		Cummings Site 2	
	No.	%	No.	%	No.	%
Projectile Points	12	3	3	2	2	1
Other Tools	1		0	0	0	0
Preforms	1	0	0	0	1	0
Primary Trimming Flakes	5	1	37	21	46	19
Biface Thinning Flakes	424	95	132	76	170	69
Shatter	3	1	1	1	26	11
TOTAL	485		188		255	

[a] Based on excavated artifacts only. Surface samples excluded as biased in favor of larger pieces.

Plate 6.6 Selected Projectile Points from Crissmans Site 5 (36Cn172),

Top Row Left : Late Woodland Triangle, grey flint
Top Row Center : Late Woodland Triangle, grey chert
Top Row Right : Late Woodland Triangle, grey flint
Bottom Row Center: Sylvan Side-Notched, grey chert


0
5cm

6.2.5 Cummings Site 2 (36Cn169)

Like Crissmans Sites 4 and 5, Cummings Site 2 was contained within a disturbed plow zone and produced no potentially significant historic remains (see above, Section 6.1.3.6). Thus, similar National Register concerns pertained, and were again assessed through analyses of diagnostic artifacts, lithic raw materials, and assemblage functional characteristics.

6.2.5.1 Diagnostic Artifacts: Despite the excavation of eight test units, only two projectile points were recovered from Cummings Site 2 during the present project, and neither was clearly diagnostic. One of these was a fragment of a point blade made of rhyolite, perhaps of Transitional age. The other was a stemmed basal point fragment, perhaps of Late Archaic age. This sample was hardly adequate to assess the number of components present at the site. However, during previous research at Cummings Site 2, an additional projectile point was recovered, and identified as Middle Archaic in age (Hay et al. 1978).

In addition to projectile points, three prehistoric ceramic artifacts were recovered from Cummings Site 2, two during shovel testing and one during test unit excavation (see above, Section 6.1.3.6). These artifacts were crushed chert tempered, cord-marked body sherds typical of the Middle and Late Woodland Period (Plate 6.4), and represented a Middle and/or Late Woodland occupation at the site. Collectively, the available evidence thus suggested that like the Crissmans sites, Cummings Site 2 had several components, including Middle Archaic, perhaps Late Archaic and Transitional, and Middle and/or Late Woodland.

6.2.5.2 Lithic Raw Material Composition: Cummings Site 2 exhibited frequencies of raw material types that were generally similar to those exhibited by Crissmans Sites 4 and 5. Chert was again the most common raw material (66%) followed by flint (25%), jasper (7%), and rhyolite (2%; Table 6.8).

6.2.5.3 Assemblage Functional Characteristics: Biface thinning flakes were the most common artifact types recovered from Cummings Site 2 (69%), followed by primary trimming flakes (19%), shatter (11%), and projectile points (1%). Other tools and preforms were not fount. These results are more fully evaluated below (see Section 6.2.6.3).

6.2.6 Assemblage and Site Comparisons

While the data analyses described above provided preliminary insights into site age and assemblage composition, their full significance relied on comparisons between assemblages and sites. Only then could functional and behavioral inferences concerning the sites in question be made.

6.2.6.1 Diagnostic Artifacts: The chronologically diagnostic artifacts recovered from Crissmans Sites 4 and 5 and Cummings Site 2 generally

yielded similar results. At all three sites, evidence of several chronological components was present, indicating use over long spans of time. Thus, it seemed likely that larger samples of diagnostic pieces would provide evidence that all three sites had been used throughout most of prehistory, with the possible exception of the Paleo-Indian Period.

6.2.6.2 Lithic Raw Material Composition: The results of the analyses of lithic raw materials indicated considerable similarity among sites. At Crissmans Site 4, Crissmans Site 5, and Cummings Site 2, chert was the most prevalent raw material, constituting approximately 57-66% of the total chipped stone assemblage from each site. Flint was next in prevalence, exhibiting percentages of 25-44% of assemblage raw material composition. Jasper (1-8%) and rhyolite (0-4%) were relatively rare at all three sites (Table 6.8).

Similarities between sites were most obvious for Cummings Site 2 and Crissmans Site 4, which included major amounts of chert and flint and minor amounts of jasper and rhyolite. At Crissmans Site 5, however, both jasper and rhyolite were virtually absent (Table 6.8). Calculations of test statistics confirmed the similarity between Cummings Site 2 and Crissmans Site 4 (x^2 = 5.04, not significant) and the dissimilarity between Crissmans Site 4 and Crissmans Site 5, and Cummings Site 2 and Crissmans Site 5 (x^2 = 13.91 and 19.78, respectively; significant when $0.01 > \alpha > 0.001$).

Collectively, these results were consistent with the interpretation of the sites in question as containing several components of different ages. With the possible exception of Crissmans Site 5, a wide variety of lithic raw materials was present, and no distinctive differences in raw material content were apparent. The lack of jasper and rhyolite at Crissmans Site 5 suggested that this site might have been occupied during a more restricted time period. In particular, use during the Transitional Period, when rhyolite was a preferred lithic resource, was improbable, as was use during the Early and Middle Archaic Periods, when jasper was a preferred resource (Shindler et al. 1982, Hay and Stevenson 1984). Otherwise, the lithic raw material data from Crissmans Site 5 were consistent with the diagnostic artifacts which indicated the presence of at least two components at the site--Late Archaic and Late Woodland.

Comparisons of raw material composition among the artifact clusters within Crissmans Site 4 and Crissmans Site 5 failed to reveal any significant differences (Table 6.10). At Crissmans Site 4, both clusters produced roughly equivalent amounts of all raw materials with the exception of rhyolite, which was more prevalent in the secondary cluster than in the core area. Considering the small sample size for rhyolite artifacts (N=17), the significance of this difference was questionable (x^2 = 11.69, not significant). Similarly, the three clusters within Crissmans Site 5 exhibited roughly equivalent amounts of chert and flint. These results suggested that the various artifact clusters within sites were at least roughly equivalent in raw material content, and that little horizontal variability in site content was present. Furthermore, the absence of clusters exhibiting distinctive raw material compositions suggested that discernible chipping clusters were not present (Cluster 1 versus Cluster 2, x^2 = 3.57, not significant; Cluster 1 versus Cluster 3, x^2 = 17.64, significant; Cluster 2 versus Cluster 3, x^2 = 3.81, not significant).

Table 6.10 Lithic Raw Material Composition for Artifact Clusters within Crissmans Site 4 (36Cn171) and Crissmans Site 5 (36Cn172)[a].

Lithic Raw Material	Crissmans Site 4				Crissmans Site 5					
	Cluster 2		Core		Cluster 1		Cluster 2		Cluster 3	
	No.	%	No.	%	No.	%	No.	%	No.	%
Chert	55	51	210	58	31	67	27	60	45	48
Flint	32	30	120	33	14	30	18	40	48	52
Jasper	9	8	27	7	1	2	0	0	0	0
Rhyolite	11	10	6	2	0	0	0	0	0	0
TOTALS	107		363		46		45		93	

[a] Based on excavated artifacts only. Surface samples excluded as biased in favor of larger pieces.

6.2.6.3 Assemblage Functional Characteristics: The results of the functional data analysis (Table 6.9) revealed significant differences between Crissmans Site 4 and both Crissmans Site 5 and Cummings Site 2 (x^2 = 24.25 and 29.94, respectively, significant). However, no significant differences between Crissmans Site 5 and Cummings Site 2 were apparent (x^2 = 11.01, not significant). These assemblage differences lay primarily in the larger numbers of projectile points and biface thinning flakes at Crissmans Site 4 and in the larger numbers of primary trimming flakes at Crissmans Site 5 and Cummings Site 2.

Collectively, these differences in assemblage composition had important implications concerning the roles that the three sites in question played in prehistoric settlement-subsistence systems. Higher percentages of projectile points and biface thinning flakes at Crissmans Sites 4 were interpreted as representing two activities--projectile point discard and replacement, and projectile point resharpening and/or manufacture from preforms. Both activities were interpreted as directly associated with hunting behavior, which was thus identified as a primary function of this site.

At Cummings Site 2 and Crissmans Site 5, lower percentages of points and biface thinning flakes coupled with higher percentages of primary trimming flakes had different functional implications. Presumably, hunting and the maintenance of hunting equipment were less prevalent activities at these sites than at Crissmans Site 4. At the same time, other activities such as lithic resohurc[processing were presumably more prevalent. Collectively, the Cummings Site 2 and Crissmans Site 5 assemblages thus reflected a more generalized activity regieme than the Crissmans Site 4 assemblage. These considerations suggested that the former sites represented a more general purpose base camp while the latter site was a special purpose hunting camp or station.

Comparisons with data from other sites in the central Pennsylvania region provided additional support for this interpretation. For comparative purposes, similar data were available for four sites of interest. These included the Milesburg Site (36Ce38) located in Centre County at the confluence of Spring and Bald Eagle Creek (Webster et al. 1977), site 36Ce114, located near the confluence of Slab Cabin Run and Spring Creek in Centre County (Hay and Stevenson 1984), Site 36Ce237(Cluster 3), located in an upland valley floor setting near Lemont Pennsylvania (Hay and Stevenson 1984), and the Jacks Mill Site (36Ce230), located at the confluence of Galbraith Gap Run and Spring Creek, immediately to the east of Boalsburg, Pennsylvania (Hay and Graetzer 1985).

In terms of assemblage composition, the Jacks Mill Site, the Milesburg Site, Site 36Ce114, Cummings Site 2, and Crissmans Site 5 were all generally similar. Projectile points, other tools, and preforms generally constituted 1-3% of total artifact assemblages. While biface thinning flakes were the predominant flake type, primary trimming flakes were also relatively common. Furthermore, where sample sizes were adequate, projectile points and other tools were present in roughly equivalent numbers (Tables 6.9 and 6.11). Previous research suggested that this generalized lithic assemblage probably reflected a variety of basic maintenance and manufacturing behaviors and

implied use of the sites in question as base camps for groups engaged in a variety of economic pursuits (Hay and Stevenson 1984, Hay and Graetzer 1985).

While the assemblages from Site 36Ce237 (Cluster 3) and from Crissmans Site 4 exhibited many characteristics in common with those from the Jacks Mill Site, the Milesburg Site, Site 36Ce114, Cummings Site 2, and Crissmans Site 5, they differed from these later sites in one notable respect: instead of having roughly equivalent numbers of projectile points and other tools, they produced eight to thirteen times as many points as other tools (Tables 6.9 and 6.11). As indicated above, this characteristic suggested use as special-purpose hunting camps rather than as general purpose base camps (Hay and Stevenson 1984, Hay and Graetzer 1985).

Comparisons with other central Pennsylvania sites thus indicated that in terms of their general functional characteristics, Crissmans Site 4, Crissmans Site 5, and Cummings Site 2 fell within several previously recognized functional site classifications. In particular, Crissmans Site 4 apparently functioned primarily as special-purpose hunting camp or station, while Cummings Site 2 and Crissmans Site 5 functioned as more general purpose base camps.

Table 6.11 Chipped Stone Artifacts from the Jacks Mill Site (36Ce230), the Milesburg Site (36Ce38), Site 36Ce114, and Site 36Ce237 (Cluster 3) (adapted from Webster et al. 1977, Hay and Stevenson 1984, and Hay and Graetzer 1985).

	Jacks Mill		Milesburg		36Ce114		36Ce237 (Cluster 3)	
Artifact Type	No.	%	No.	%	No.	%	No.	%
Projectile Point	26	2	110	?	9	1	15	2
Other Tools	40	3	111	?	15	1	2	0
Preforms	34	2	84	?	13	1	14	2
Primary Trimming Flakes	184	12	nd[a]	?	25	2	68	11
Biface Thinning Flakes	819	52	nd[a]	?	648	50	248	46
Shatter	480	30	nd[a]	?	621	48	235	38
TOTALS	1583		nd[a]		1306		618	

[a] No data.

7.0 SITE SUMMARIES

7.1 Island View Site (36Cn166)

The Island View Site lies within Island View Park, a small, grass-covered park located in the northwestern portion of Lock Haven near the intersection of Water and West Church Streets. The site was first discovered in 1978 during a reconnaissance level survey of the Lock Haven Flood Protection Project area (Hay et al. 1978). At the time of discovery, the site was situated on level terrain at an elevation of approximately 5.5-5.9 m (18-19') above the West Branch of the Susquehanna River. Immediately to the north, the land sloped steeply downwards to sand spits along the edge of the West Branch (see above, Sections 3.4.1 and 6.1.2.1).

At the time of discovery, the Island View Site (36Cn166) was identified as a small remnant of a once larger site that extended beyond the margins of the park into areas now covered by parking lots, railroads, and city streets. During the 1978 reconnaissance survey of the Lock Haven Flood Protection Project area, local informants reported that extensive remains, including burials, had been exposed during construction of the Lock Haven University parking lot to the east of the park (Hay et al. 1978). Whether any portions of the Island View Site remain intact under this parking lot or in any other developed area surrounding the park is not known. Since discovery, additional disturbance to what remained of the site has occurred, and resulted from construction of a boating access ramp leading from the above-mentioned parking lot to the low-lying terrain at the water's edge (see above, Sections 3.4.1 and 6.1.2.1).

During the reconnaissance level investigations conducted in 1978, two auger probes and one test pit were excavated within Island View Park. Based on these tests, the Island View Site was tentatively identified as a deeply stratified, multi-component site with Late Woodland, Transitional, and Archaic components. Whether these components were mixed or within undisturbed stratigraphic contexts was not determined (Hay et al. 1978). The research conducted during the present project involved Phase II site testing, and was designed to assess aspects of internal site structure and content relevant to an evaluation of the site's eligibility for inclusion on the National Register of Historic Places.

Phase II testing at the Island View Site involved preliminary auger probes to provide stratigraphic control and the subsequent excavation of three 2 m x 2 m (6.5' x 6.5') test units, termed Units 1-3. Test Unit 1 was located near the parking lot at the eastern end of the intact portion of the site, Test Unit 2 was located near the western end of the park, and Test Unit 3 was approximately midway between Units 1 and 2. Excavations in these units revealed generally similar soil profiles. The uppermost level consisted of fill that had been placed during the construction of the boating access ramp. Termed Zone I, this fill extended from depths of approximately 5 cm (2") in Unit 2 to 30 cm (12") in Unit 1, and was underlain by Zone II, a dark, greyish brown silt loam containing ash, coal, cinders, and clinkers as well as prehistoric, historic, and modern

artifacts. In addition, Zone II contained several historic features, including single course brick walls and asphalt pavements. The top of Zone II was interpreted as representing the surface of Island View Park prior to the construction of the boating access ramp. The features it contained were presumably buried during fill placement at the time Island View Park was created. In conjunction with informant interviews, these features indicated that the Island View Park area had once been the site of residential housing (see above, Section 6.1.3.2).

At depths of 20 cm (8") to 45 cm (18"), Zone II was underlain by Zone III, which consisted of generally similar but slightly lighter colored deposits, and contained both prehistoric and historic artifacts. Beneath Zone III at depths of 45 cm (18") to 65 cm (26"), was Zone IV, a dark brown sandy loam which again contained both historic and prehistoric artifacts. An additional historic feature was encountered in this zone, and consisted of a rubble-filled trench of undetermined function. Zone IV was interpreted as a buried A-horizon soil, probably representing the land surface at the time of first Euro-American settlement in the area (see above, Section 6.1.3.2).

Zone IV extended to depths of 55 cm (22") to 75 cm (30"), and was underlain by Zone V, a brown silt loam which, with the exception of Unit 2, effectively contained prehistoric artifacts only. At the base of Zone IV and extending into Zone V was a possible prehistoric feature consisting of an area of reddened (burned) earth. Zone V extended to depths of 100 cm (39") to 135 cm (53"), and contained prehistoric artifacts throughout. Near the bottom of the zone, artifact densities dropped distinctly. Below Zone V, Zone VI was encountered, and consisted of a culturally sterile light brown clay loam (see above, Section 6.1.3.2).

The results of excavation thus suggested that the Island View Site was a deeply stratified site containing both prehistoric and historic components. Following excavation, laboratory analyses of the artifacts recovered from the site were conducted, and were designed to address several key issues concerning site integrity. Specifically, analyses of historic period artifacts were conducted to determine whether the historic levels at the site possessed stratigraphic integrity or were disturbed and mixed. Similarly, analyses of the prehistoric artifacts were conducted to determine whether the lower levels within the site were intact, and contained a discernible sequence of site occupations, or whether the levels in question had been disturbed, thus mixing artifacts from different periods (see above, Section 6.2.2).

Laboratory analyses provided several key insights relative to the internal structure of the Island View Site. Analyses of historic period diagnostic artifacts indicated that both modern and pre-modern artifacts were present within Zones I, II, and III. This result indicated that these levels had experienced considerable disturbance and artifact mixing, and thus had little potential information value. In addition, historic artifacts extended to considerably greater depths in Unit 2, where they occurred in significant numbers within the upper portions of Zone V. This

latter result suggested that in the immediate vicinity of Unit 2, site disturbance extended well into the prehistoric component (see above, Section 6.2.2.4).

Analyses of prehistoric diagnostic artifacts were also conducted, and provided further insights into the integrity of the site. Within Unit 1, the prehistoric diagnostics revealed what appeared to be an intact chronological sequence of artifact types within the prehistoric component. Within Zone IV and the uppermost levels of Zone V, Late Woodland ceramics were present, associated with substantial amounts of chronologically non-diagnostic lithic debitage. Directly below these Late Woodland levels was a level that produced Early Woodland ceramic materials in association with a steatite (Transitional) sherd. Below this latter level were several preceramic levels that contained lithic artifacts only, and at the bottom of the sequence, several Late Archaic projectile points were found (see above, Section 6.2.2).

In contrast, the diagnostic artifacts from the prehistoric component within Unit 2 failed to exhibit a coherent chronological sequence. For example, Late Archaic projectile points were recovered from the upper portions of the sequence in stratigraphic positions above ceramic artifacts, providing clear evidence of artifact mixing (see above, Section 6.2.2).

The only prehistoric diagnostic recovered from Unit 3 was an Early Woodland Adena point from near the top of the prehistoric component. However, important negative evidence was provided by the absence of significant numbers of ceramic artifacts in the upper prehistoric levels. This result suggested that the upper prehistoric levels at Unit 3 had been removed by earth-moving activities prior to the deposition of Zones I, II, and III (see above, Section 6.2.2).

To further evaluate the integrity of the prehistoric component at the Island View Site, analyses of lithic raw materials were conducted. The results for Unit 1 revealed patterned changes in lithic raw material utilization through prehistoric time--a result that supported the hypothesis that an intact chronological sequence was present. Of particular significance was a clear rhyolite peak, associated with Transitional and Early Woodland diagnostics. For Unit 2, patterning in raw material usage was less obvious--a result consistent with the interpretation of this unit as significantly disturbed. Finally, Unit 3 again showed patterned changes in lithic raw material composition. Furthermore, these changes correlated with the lower levels in Unit 1--a result that provided additional evidence that the upper, ceramic-bearing levels in Unit 3 had been artificially removed (see above, Section 6.2.2).

Collectively, the results of research at the Island View Site provided internally consistent evidence concerning site integrity and artifact content. The historic component at the site, represented by Zones I, II, and III, was clearly disturbed and had little potential to provide new information about the past. In the immediate vicinity of Unit 2, site

disturbance penetrated into the prehistoric zones as well. While the exact nature of disturbance in this area was not clear, the prehistoric levels that were affected had little potential information content. Throughout the remainder of the site, however, intact prehistoric deposits were present below the upper levels of disturbed historic fill. These latter deposits had the potential to provide important new information about changing artifact styles and material culture during the prehistoric past.

7.2 Crissmans Site 2 (36Cn167)

Crissmans Site 2 was situated within the large cultivated field that extended along the U.S. Route 220 embankment from the T-375 underpass to the Castanea Township Fire Company property, and was on the first Wisconsin terrace above the Bald Eagle Creek floodplain. The site was located near the eastern end of the field, and extended from Route T-375 approximately 350 m (1148') to the west along the U.S. Route 220 embankment. Crissmans Site 2 was originally discovered in 1978 during the above-mentioned reconnaissance level survey of the Lock Haven Flood Protection Project area. At the time of discovery, 23 lithic artifacts were recovered from the surface of the site, which was identified as a sparse lithic scatter (see above, Sections 3.4.5 and 6.1.2.3).

During the present study, Crissmans Site 2 was relocated through intensive pedestrian surface survey, during which 28 additional lithic artifacts were point provenienced and recovered from the surface of the site. In addition, one 2 m x 2 m (6.5' x 6.5') test unit was excavated within the portion of the site exhibiting highest artifact densities, as indicated by the surface survey. These procedures confirmed the low artifact density of the site (approximately 9 artifacts/m^3), which was again identified as a low density, plow zone lithic scatter. No diagnostic artifacts were recovered from the site, no features were encountered, and the small sample of lithics made an estimate of age for the site based on raw material extremely uncertain. These characteristics suggested that Crissmans Site 2 had little potential to provide important information about the past (see above, Section 6.1.3.5).

7.3 Crissmans Site 3 (36Cn168)

Crissmans Site 3 was also situated on the first Wisconsin terrace within the large cultivated field between Route T-375 and the Castanea Township Fire Company. It was located in the eastern half of the field, and extended for approximately 350 m (1148") along the U.S. Route 220 embankment, from just to the west of the Crissmans Site 2 to a point approximately 100 m (328') to the east of the abandoned road that crossed the cultivated field at its approximate midpoint. Like Crissmans Site 2, Crissmans Site 3 was discovered during the 1978 reconnaissance of the Lock Haven Flood Protection Project area, at which time two lithic artifacts were recovered from the site. Also like Crissmans Site 2, Crissmans Site 3 was identified as a low density, plow zone lithic scatter (see above, Sections 3.4.5 and 6.1.2.4).

During the present study, the boundaries of Crissmans Site 3 were redefined during intensive pedestrian surface survey, and 33 additional lithic artifacts were recovered from its surface. As at Crissmans Site 2, a single 2 m x 2 m (6.5' x 6.5') test unit was excavated at the site to confirm low artifact densities. This test produced a total of 18 artifacts, indicating artifact densities of approximately 13 artifacts/m^3. As with Crissmans Site 2, these results suggested that the site possessed little potential information content (see above, Section 6.1.3.5).

7.4 Crissmans Site 4 (36Cn171)

Crissmans Site 4 was located on the Wisconsin terrace within the western half of the large cultivated field described above. The site extended along the U.S. Route 220 embankment from the abandoned road in the middle of the field to the west for approximately 350 m (1148'). During the present study, Crissmans Site 4 was discovered during intensive pedestrian surface survey along the U.S. Route 220 levee alignment. This survey indicated that while most of the site exhibited low artifact densities, several subareas within the site showed somewhat higher artifact densities. In particular, a "core area" of higher density was present near the western site boundary, and a secondary artifact cluster existed just to the east of this core area (see above, Sections 6.1.2.5 and 6.1.3.5).

During the surface survey, approximately 200 lithic artifacts, including two diagnostic projectile points, were recovered from the site. Subsequently, seven 2 m x 2 m (6.5' x 6.5') test units were excavated within site boundaries. Four of these units were placed within the "core area" of highest artifact density, two units were placed within the secondary artifact cluster, and one unit was placed within the low density site periphery (see above, Section 6.1.3.5).

Especially within the core area of the site, testing procedures indicated distinctly higher artifact densities (28 artifacts/m^3 to 83 artifacts/m^3) than observed at Crissmans Site 2 and Crissmans Site 3. In addition, five additional diagnostic projectile points, including two Late Archaic Sylvan Side-Notched points, one Late Archaic Normanskill point, and two Late Woodland triangular points were recovered. These points indicated that several chronologically distinct site components were present at the site (see above, Section 6.2.3.1).

Analyses of the lithic artifact assemblage recovered from Crissmans Site 4 provided additional insights into site age and function. Specifically, the lithic raw material composition of the assemblage from the site was consistent with its interpretation as essentially multi-component. Furthermore, intra-site variability in the distribution of lithic raw material was not apparent, and suggested that chipping clusters were not present. However, analyses of the functional characteristics of the assemblage revealed distinctly high percentages of projectile points and biface thinning flakes. These characteristics indicated that during the periods when it was used, Crissmans Site 4 had functioned primarily as a special-purpose hunting camp (see above, Section

6.2.6).

7.5 Crissmans Site 5 (36Cn172)

Crissmans Site 5 was located on the Wisconsin terrace within the westernmost portion of the above-described cultivated field, and extended from the Castanea Township Fire Company property approximately 200 m (656') to the east. The site was discovered during the present project during intensive surface survey along the U.S. Route 220 levee alignment. As with Crissmans Site 4, Crissmans Site 5 exhibited generally low artifact densities, but also included several higher density artifact clusters. Three such clusters were present, one located near the eastern site boundary, one near the western site boundary, and one approximately midway between these two (see above, Section 6.1.3.5).

During the surface survey, 42 lithic artifacts were recovered from the site. In addition, seven 2 m x 2 m (6.5' x 6.5') test pits were excavated within site boundaries. Three of these were placed within the easternmost artifact cluster, while two units each were placed within the western and central artifact clusters. These excavations revealed artifact densities ranging from 14 artifacts/m^3 to 20 artifacts/m^3, and produced three diagnostic artifacts, including a Late Archaic Sylvan Side-Notched point and two Late Woodland triangles. As at Crissmans Site 4, these points indicated that several chronologically distinct components were present at the site (see above, Sections 6.2.3.5 and 6.2.4.1).

Analyses of the lithic raw material content of Crissmans Site 5 revealed less variability than at Crissmans Site 4. In particular, the near absence of rhyolite and jasper suggested little or no site use during the Transitional period, and perhaps during the Early and Middle Archaic Periods as well. Again, chipping clusters were not apparent. Lower percentages of projectile points and biface thinning flakes indicated that Crissmans Site 5 had functioned as a more general purpose camp than had Crissmans Site 4 (see above, Section 6.2.6).

7.6 Cummings Site 2 (36Cn169)

Cummings Site 2 was located immediately to the west of the Jay-Street connector, and extended for approximately 100 m (328') along the U.S. Route 220 embankment. The site was situated within grass and scrub-covered terrain on the first Wisconsin terrace above the Bald Eagle Creek floodplain. The site was originally discovered during the 1978 reconnaissance of the Lock Haven Flood Protection Project area (Hay et al. 1978). At the time of discovery, a portion of the site was within a (then) cultivated field. Intensive surface survey of this field produced 61 lithic artifacts, including a Middle Archaic projectile point, from within site boundaries. In addition, a 1 m x 1 m (3.3' x 3.3') test pit was excavated at the site, and produced 20 additional lithic artifacts, but no diagnostic materials. A possible prehistoric feature, consisting of a concentration of charcoal at the plow zone/subsoil interface, was identified. Based on these findings, the site was interpreted as a

multi-component plow zone site at which features might be preserved (see above, Sections 3.4.7 and 6.1.2.7).

During the present project, the boundaries of Cummings Site 2 within the project area were identified through shovel test excavations, which produced a total of 18 lithic and two ceramic artifacts from within the site area. Subsequently, eight 2 m x 2 m (6.5' x 6.5') test units were excavated within the site. These units revealed low to moderate artifact densities (10-83 artifacts/m3), and produced only one reliable diagnostic artifact--a Late Woodland body sherd. Also discovered were projectile point fragments probably dating to the Late Archaic and Transitional Periods. In conjunction with the reconnaissance survey, these results indicated that the Cummings Site 2 was a multi-component site. Despite the reconnaissance survey results, no features were encountered (see above, Section 6.1.3.6).

Analyses of the lithic artifacts recovered from Cummings Site 2 provided additional insights into site age and function. As with Crissmans Site 4, the Cummings Site 2 assemblage exhibited a wide range of raw material types. This result was consistent with the hypothesis that numerous components were present. Artifact assemblage functional characteristics for Cummings Site 2 contrasted with those for Crissmans Site 4 but were similar to Crissmans Site 5. The Cummings Site 2 assemblage exhibited lower percentages of projectile points and biface thinning flakes than Crissmans Site 4--a result that suggested use as a general-purpose base camp rather than as a special-purpose hunting camp (see above, Section 6.2.6).

7.7 Cummings Site 3 (36Cn173)

Cummings Site 3 was discovered during shovel testing operations between Hanna Street and the Jay-Street Connector and was located approximately 50 m (164') north of Bald Eagle Creek. It was contained within an Ap-soil horizon underlain by a well-developed B-horizon, and was situated on the first Wisconsin terrace. From consecutive shovel tests along a transect paralleling the western berm of Hanna Street and the southern margin of the U.S. Route 220 embankment, 40 lithic artifacts were recovered (see above, Section 6.1.3.6). These results indicated that a prehistoric site exhibiting moderate artifact densities was present. While clearly unstratified, feature preservation at Cummings Site 3 remained a possibility. No Phase II testing to confirm or deny this possibility was conducted due to the specifications of the scope of work for this project.

7.8 Cummings Site 4 (36Cn174)

Cummings Site 4 was discovered during shovel testing operations along the U.S. Route 220 embankment. The site was first encountered in a test approximately 300 m (984') to the west of the Jay-Street connector. Additional shovel tests indicated that the site extended at least 120 m (390') to the west of the initial find spot. Eleven lithic artifacts were recovered from the tests excavated within the site, indicating that a low

to moderate density prehistoric site was present. The site was contained within an Ap-soil horizon located on the first Wisconsin terrace (see above, Section 6.1.3.6). As with Cummings Site 3, no Phase II testing was conducted at Cummings Site 4.

7.9 Cummings Site 5 (36Cn175)

Cummings Site 5 was also discovered during shovel testing operations along the U.S. Route 220 embankment. It was located approximately 450 m (1463') to the west of the Jay-Street connector, and was within an area of grass and shrub vegetation of the first Wisconsin terrace. In this area, two consecutive shovel tests each produced a single prehistoric body sherd, indicating that a low density prehistoric site was present (see above, Section 6.1.3.6). No Phase II testing was conducted at Cummings Site 5.

7.10 Water Street Site 2 (36Cn170)

Water Street Site 2 was discovered during shovel testing operations within a narrow 315 m (1034') long strip of municipal park that borders Water Street between Sixth and Fourth Streets. Testing in this locality produced six prehistoric flakes from an A-horizon soil buried under 35 cm (14") to 100 cm (39') of recent and historic fill. This A-horizon was encountered in a restricted area measuring approximately 60 m x 6 m (195' x 20') located at the eastern end of the strip of park between Sixth and Fourth Streets. Within the remainder of this area, either impenetrable fill was present or a truncated soil profile lacking an A-horizon was encountered. These results indicated that Water Street Site 2 (36Cn170) consisted of a remnant of a site that once existed in the area between Sixth and Fourth Streets, and perhaps beyond. With the exception of the small remnant discovered during this project, the site has presumably been extensively disturbed by A-horizon stripping, fill placement, and municipal development (see above, Section 6.1.3.4). As with Cummings Site 3 and Cummings Site 4, no Phase II testing of Water Street Site 2 was conducted.

8.0 NATIONAL REGISTER ELIGIBILITY OF SITES

8.1 Introduction

To be eligible for inclusion on the National Register of Historic Places, a district, site, building, structure, or object must possess integrity of location, design, setting, materials, workmanship, feeling, and association and must:

A. be associated with events that have made a significant contribution to the broad patterns of our history; or
B. be associated with the lives of persons significant in our past; or
C. embody the distinctive characteristics of a type, a period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
D. have yielded, or be likely to yield, information important in prehistory or history (NPS 1982: 36CFR60.6)

To apply these criteria to specific properties or districts involves interpretation at several levels. The first step is to interpret how the criteria apply within the specific historic context or contexts to which the property belongs. After interpreting the criteria for specific historic contexts, it is necessary to identify the property type and the integrity of the property in question. If the property is determined to have the degree of integrity required of its property type, it is considered eligible. If it does not, it is either considered not significant, or the property type and integrity levels are re-evaluated.

The six archaeological sites tested for National Register eligibility during the present project were evaluated using the criteria for significance established by the National Register of Historic Places, as enumerated above. These criteria were applied within the framework of the study units defined in A Comprehensive Plan for the Conservation of Archaeological Resources in Pennsylvania (Raber 1985). In general, it was found that criterion D (likely to yield information important in prehistory or history) was the relevant criterion. For this criterion, integrity assessments were based on whether the property in question had the potential to provide important new data contributing to the information needs identified for its study unit.

As defined in the above-referenced state plan, the Lock Haven area falls within the Ridge and Valley Province study unit. A series of key research issues for this study unit are defined in the plan, and include

1. Environmental reconstruction. Since cultural ecologically based research centers around man-environment relationships, this topic relates to all others to varying degrees.

2. Ceramic and lithic typology. The chronological and ethnic utility of artifact "types" needs to be examined for each local area.
3. Lithic technology, use-wear analysis, and sourcing. Lithics research is still a growing field in archaeology, through which a number of important questions concerning site function, settlement systems, and trade can be addressed.
4. Alternate methods of dating--e.g., the hydration of flints. The principles regulating obsidian hydration also pertain to flints and jaspers. Local materials could contribute to the development of the technique.
5. The adoption of agriculture. The culture changes brought on by the transition to agriculture are poorly known in this region.
6. The reconstruction of social organization. Through settlement system studies, mortuary analyses and other means, phase-specific models of social organization can and must be tested.
7. Demographic reconstruction. As population change was a likely catalyst of important cultural changes, demographic studies are of critical importance for the region.
8. Adaptive variation in Hunter-gatherer and Tribal societies. This region contains large numbers of varied examples of these forms of society. Why did this variation exist? The archaeological record is well preserved and potentially quite valuable in answering this question.
9. The analysis of local industry. Lumbering, mining, and production towns are commonplace in this region and provide excellent opportunities for research concerning the life-styles of their inhabitants an the interaction between local industry and the marketplace. (Hatch et al. 1985).

The sites tested during the present project were evaluated based on their potential contributions to the research topics enumerated above.

8.2 Island View Site (36Cn166)

As a small remnant of a once-larger site (see above, Sections 3.4.1, 6.1.2.1, and 6.1.3.2), the extant portions of the Island View Site are probably not adequate to identify original site size or internal organization. For this reason, the site can contribute little information relevant to research issues #6-#8 (social organization, demographic reconstruction, and adaptive variation) above. Similarly, since the historic levels at the site were disturbed (see above, Section 6.2.2.4), they are likely to contain little information of significance to historic research issues such as #9 (analysis of local industry) above. In contrast, however, the Island View Site contains an intact prehistoric cultural sequence that may provide important information concerning changes in artifact styles and material culture during prehistoric times (see

above, Sections 6.1.3.2 and 6.2.2). Such information would clearly contribute to research issue #2 (ceramic and lithic typology). If prehistoric features with preserved organic remains exist at the site, the stratigraphic sequence it contains could also contribute to research issues #1 (environmental reconstructions) and #5 (adoption of agriculture). Thus, the Island View Site should be considered eligible for inclusion on the National Register of Historic Places.

8.3 Crissmans Sites 2 and 3 (36Cn167 and 36Cn168)

Crissmans Sites 2 and 3 are low density lithic scatters contained within plow zone contexts (see above, Sections 3.4.5 and 6.1.3.5). As such, they represent portions of a general, but intermittent, artifact scatter that covers most of the large cultivated field between the Castanea Township Fire Company property and the Bald Eagle Creek-West Branch confluence. Within this scatter, areas of higher artifact density occur, and represent preferred areas of prehistoric use or habitation. Several such areas have been identified to date, and include Site 36Cn46 and 36Cn46a, which are outside of the Lock Haven Flood Protection Project area (see above, Sections 3.4.4 and 3.4.5), and the high artifact density areas, or clusters, within Crissmans Sites 4 and 5 (see above, Section 6.1.3.5). The remainder of the scatter, represented by Crissmans Sites 2 and 3 and by the low density portions of Crissmans Sites 4 and 5, was probably produced by innumerable ephemeral camping and/or tool resharpening episodes by small groups engaged in hunting, fishing, nut collecting, and the like. They may also represent occasional work tasks conducted away from primary habitation sites. Today, all that remains of these activities is the above-described low density lithic scatter—a resource type that is neither dateable nor functionally specific. Thus, it is not possible to identify the age or specific behaviors responsible for the deposition of the lithic scatters at Crissmans Site 2 and 3. Under these circumstances, these sites have little potential information value vis-a-vis the research issues enumerated above, and should not be considered eligible for inclusion on the National Register of Historic Places.

8.4 Crissmans Sites 4 and 5 (36Cn171 and 36Cn172)

As indicated above, Crissmans Sites 4 and 5 are low density lithic scatters that contain sub-areas exhibiting higher artifact densities (see above, Section 6.1.3.5). Research conducted during the present project indicated that these sites, as well as the higher artifact density sub-areas within them, contained multi-component, mixed assemblages, and that features were not present (see above, Sections 6.1.3.5, 6.2.3, and 6.2.4). Under these circumstances, phase-specific reconstructions of site size, artifact density, or internal site structure were not possible, thus severely limiting the contributions of these sites to research issues #1, #2, #5, and #7 (environmental reconstruction, ceramic and lithic typology, adoption of agriculture, demographic reconstruction). Issues #3, #4, and #9 (Lithic technology, dating, analysis of local industries) were not relevant to the type of resource represented by these sites. However, within the context of regional settlement system studies, Crissmans Sites 4

and 5 could make contributions to research issue #6 (social organization), and hence to research issue #8 (adaptive variation).

Analyses of the chipped stone assemblage from Crissmans Sites 4 and 5 indicated that the former site had functioned primarily as a special-purpose hunting camp or station while the latter site functioned as a more general purpose base camp--roles they presumably played in settlement and subsistence systems during most of prehistory (see above, Section 6.2.6). Within the context of future phase- or period-specific settlement system reconstructions, these localities can be identified as sites that played specific roles in the settlement systems in question, and can thus contribute to overall research goals, as enumerated in issues #6 (social organization) and #8 (adaptive variation).

It should be emphasized, however, that for Crissmans Sites 4 and 5, the basic parameters of site age and function were identified during the present study. Thus the potential research benefits of these sites to issues #6 (social organization) and #8 (adaptive variation) have been realized. Therefore, these sites have little additional potential information value, and should not be considered eligible for inclusion on the National Register of Historic Places.

8.5 Cummings Site 2 (36Cn169)

Cummings Site 2 consists of a low to moderate density, plow zone lithic scatter (see above, Section 6.1.3.6). The site contains numerous components and lacks features (see above, Sections 6.1.3.6 and 6.2.5), thus precluding phase-specific reconstructions of site size, artifact density, and internal site structure. These characteristics limited the possible contributions of Cummings Site 2 to research issues #1, #2, #5, and #7 (environmental reconstruction, ceramic and lithic typology, adoption of agriculture, and demographic reconstruction). Again, issues #3, #4, and #9 (lithic technology, dating, analysis of local industries) were not relevant to this type of resource. However, as with Crissmans Sites 4 and 5, research conducted during the present project identified the basic parameters of site age and function. In the case of Cummings Site 2, a multi-component base camp was again identified (see above, Section 6.2.6). This information is of potential value within the context of future settlement pattern research. Again, however, the information in question has been provided by the present study, and little additional information can be expected from Cummings Site 2. Under these circumstances, this site should not be considered eligible for inclusion on the National Register of Historic Places.

8.6 Cummings Sites 3, and 4 (36Cn173 and 36Cn174)

Cummings Sites 3 and 4 were discovered during the Phase I survey of the U.S. Route 220 alignment between Hanna Street and Bald Eagle Creek. These sites consisted of low to moderate density lithic scatters contained within plow zone contexts. In these respects, Cummings Sites 3 and 4 are probably similar to Crissmans Sites 4 and 5 and Cummings Site 2. However,

they may differ significantly from these latter sites in artifact content and feature preservation. In addition, no information concerning site age or function is presently available. Thus, evaluations of National Register eligibility are not at present possible.

8.7 Water Street Site 2 (36Cn170)

Water Street Site 2 was discovered within the narrow strip of municipal park that parallels Water Street between Sixth and Fourth Streets. It was contained within a buried A-horizon soil, and produced six chipped lithic artifacts from a restricted area approximately 60 m x 6 m (195' x 20'). Areas around the site exhibited evidence of extensive disturbance, indicating that the site area of today probably represents a small remnant of a once larger site. Present evidence is not sufficient to evaluate site age, function, or feature preservation. Thus, the available information is not sufficient to evaluate the National Register eligibility of this site.

8.8 Cummings Site 5 (36Cn177)

Cummings Site 5 was discovered during the Phase I survey of the U.S. Route 220 alignment between Hanna Street and the Bald Eagle Creek. The site was found in two successive shovel tests, each of which produced a single prehistoric ceramic sherd (see above, Section 6.1.3.6). These results indicated that the site was a small, low density artifact scatter, perhaps with a predominance of ceramic rather than lithic artifacts. In terms of overall artifact density, Cummings Site 5 was roughly equivalent to Crissmans Sites 2 and 3. Behaviorally, a similar interpretation of Cummings Site 5 was thus appropriate (see above, Section 8.3). Thus, the site was interpreted as representing an ephemeral episode of use, and as being a resource type with little potential information content. These considerations indicated that Cummings Site 5 was not eligible for inclusion on the National Register of Historic Places.

9.0 SUMMARY OF RESEARCH RESULTS

Archaeological research within the Lock Haven Flood Protection Project area involved both Phase I site survey and Phase II site testing. Phase I survey procedures involved pedestrian surface survey, shovel tests, and deep auger probes. These procedures were used to discover archaeological sites in previously unsurveyed portions of the levee system alignment and to confirm the locations and boundaries of previously discovered archaeological sites. Phase I surveys were conducted within the strip of municipal park between Sixth and Fourth Streets, along the U.S. Route 220 alignment, and at the Bald Eagle Creek upstream tie out. Surveys were proposed for the Susquehanna River upstream tie out and for a small parcel of AM-PM Mini Mart property immediately to the east of the Lock Haven University parking lot. However, access to these latter properties was denied and/or they exhibited extensive disturbance, thus precluding effective survey.

During Phase I survey, six previously unrecorded archaeological sites were discovered, and the locations of four previously recorded sites were confirmed. Previously unrecorded sites included 1) Water Street Site 2 (36Cn170), located in the above-mentioned strip of municipal park between Sixth and Fourth Streets; 2) Crissmans Site 4 (36Cn171), located along the U.S. Route 220 embankment in a large cultivated field; 3) Crissmans Site 5 (36Cn172), also located in the large cultivated field along the U.S. Route 220 embankment; 4) Cummings Site 3 (36Cn173), located along the U.S. Route 220 embankment to the west of Hanna Street; 5) Cummings Site 4 (36Cn174), located along the U.S. Route 220 embankment to the west of the Jay-Street connector, and 6) Cummings Site 5 (36Cn177), also located along the U.S. 220 embankment to the west of the Jay-Street connector.

Previously discovered sites included 1) the Island View Site (36Cn166), located within Island View Park just to the west of the Lock Haven University parking lot; 2) Crissmans Site 2 (36Cn167), located in the cultivated field along the U.S Route 220 embankment; 3) Crissmans Site 3 (36Cn168), also located in the cultivated field along U.S. Route 220; and 4) Cummings Site 2 (36Cn169), located along the U.S. Route 220 embankment to the west of the Jay-Street connector.

At six of the above-mentioned sites, Phase II testing was conducted to evaluate site eligibility for inclusion on the National Register of Historic Places. These six sites included the Island View Site, Crissmans Sites 2-5, and Cummings Site 2. Testing procedure involved the excavation of one to eight 2 m x 2 m (6.5' x 6.5') test units within site boundaries. In addition, laboratory analyses of the artifacts recovered were conducted, and involved projectile point typology; identification of lithic raw materials; classification of lithic artifacts by function; identification of ceramic artifacts; and classification of historic artifacts.

The results of Phase II research at the Island View Site indicated that a deeply stratified, multi-component site was present. While the upper levels at the site consisted of disturbed historic and modern fill,

the lower levels exhibited an intact, stratified cultural sequence spanning Late Archaic through Late Woodland times. These results indicated that the Island View Site should be considered eligible for inclusion on the National Register of Historic Places.

Phase II research at Crissmans Sites 2 and 3 confirmed that these sites represented low density, plow zone lithic scatters with little information potential. These results indicated that Crissmans Sites 2 and 3 were not eligible for inclusion on the National Register of Historic Places.

Phase II research at Crissmans Sites 4 and 5 indicated that these sites generally consisted of low density, plow zone lithic scatters as well; unlike Crissmans Sites 2 and 3, however, Crissmans Sites 4 and 5 included subareas where higher artifact densities were present. These latter areas were identified as multi-component sites that had functioned primarily as a small hunting camp and a small base camp, respectively. In terms of general age and function, Crissmans Sites 4 and 5 had the potential to contribute useful information for settlement/subsistence system studies. However, since this information was provided by the present study, these sites should not be considered eligible for inclusion on the National Register of Historic Places.

Similar results were obtained for Cummings Site 2. Like Crissmans Sites 4 and 5, Cummings Site 2 was identified as a multi-component, plow zone lithic scatter. In addition, the basic parameters of site age and function were identified, and indicated site occupations from Middle Archaic to Late Woodland times and use as a small base camp. The potential information content of the site was provided by the present study, and Cummings Site 2 was therefore considered to be ineligible for inclusion on the National Register of Historic Places.

At Water Street Site 2 and at Cummings Sites 3 and 4, only Phase I survey procedures were used. These procedures provided insufficient information to evaluate the National Register eligibility of Water Street Site 2 and Cummings Sites 3 and 4. At Cummings Site 5, only Phase I survey procedures were again used. However, these procedures indicated that Cummings Site 5 was a small, sparse artifact scatter with little information potential. This latter site was therefore considered to be ineligible for inclusion on the National Register of Historic Places.

10.0 PROJECT EFFECTS AND RECOMMENDATIONS FOR FUTURE STUDY

10.1 Recommendations for Additional Phase I Survey

With the exception of five small properties where access was denied or where toxic contamination was present, Phase I survey of the levee alignments covered by this study was comprehensive. The small properties not surveyed included 1) a small area of residential lawn at the Susquehanna River upstream tie-out, 2) several small properties along Water Street immediately to the east of the Lock Haven University parking lot, 3) the Castanea Fire Company property, 4) a small Pennsylvania Department of Transportation residual immediately to the west of the Jay-Street connector, and 5) a toxic drainageway between the Jay-Street connector and Bald Egale Creek. As indicated above (see Section 6.1.3.1), the area at the Susquehanna River upstream tie-out has a low probability of site occurrrence; therefore no additional Phase I survey in this area is recommended. Due to toxic contamination, Phase I survey of the drainageway between the Jay-Street connector and Bald Eagle Creek is not feasible. The remaining parcels enumerated above should be surveyed when project rights-of-way have been acquired.

10.2 Recommendedations for Additional Phase II Survey

Insufficient information is presently available to assess the National Register eligibility of three sites within the area covered by this project. These sites include Water Street Site 2 (36Cn170), Cummings Site 3 (36Cn173), and Cummings Site 4 (36Cn174) (see above, Sections 8.6 and 8.7). If subject to adverse project effects, it is therefore recommended that Phase II research, conforming to the standards and policies of the Pennsylvania Bureau for Historic Preservation, be conducted at these three sites.

10.2.1 Water Street Site 2 (36Cn170)

Water Street Site 2 consists of a small, potentially intact remnant of a once larger site, much of which has been heavily disturbed by municipal development. Evidence from the present project indicated that outside of its presently defined boundaries, this site probably lacks integrity. Within its boundaries, however, the site exists within an intact, buried A-horizon soil that overlies undisturbed B- and C-horizon soil materials (see above, Section 6.1.3.4). Under these circumstances, the site may contain features and/or stratified deposits, and may possess integrity. Like the Island View Site, Water Street Site 2 may thus contain significant information.

The proposed Lock Haven Flood Protection Levee alignment will pass through the strip of municipal park within which Water Street Site 2 lies. Unless an alternative alignment is selected, the site, as presently defined, will be destroyed by levee construction. It is therefore recommended that Phase II research be conducted at Water Street Site 2 to determine its eligibility for inclusion on the National Register of

Historic Places.

Phase II testing at Water Street Site 2 should include the excavation of 2 m x 2 m (6.5' x 6.5') test units at regular intervals within site boundaries. These tests should be excavated mechanically to remove the historic fill in the area and subsequently by manual techniques to assess site integrity. The testing procedures should be designed to evaluate the extent of site disturbance, and to evaluate possible site contributions to prehistoric research. Considering the small size of Water Street Site 2, approximately five 2 m x 2 m (6.5' x 6.5') test units should be sufficient to establish National Register eligibility.

10.2.2 Cummings Site 3 (36Cn173)

Cummings Site 3 consists of a moderate density lithic scatter contained within plow zone contexts. Although the A-horizon has been disturbed by cultivation, the underlying B-horizon may contain intact features. Furthermore, the age and function of the site cannot be assessed with the available artifact sample. For these reasons, Cummings Site 3 is potentially eligible for inclusion on the National Register of Historic Places (see above, Sections 6.1.3.6, 6.2.1, and 8.6).

Located within the levee alignment along the western berm of Hanna Street and the southern margin of the U.S. Route 220 embankment, Cummings Site 3 is subject to possible project effects arising from levee construction and roadway elevation along Hanna Street and from placing the impervious blanket on the U.S. Route 220 embankment. Along Hanna Street, the site extends to the western edge of the pavement. In this area, any earth moving activities outside and to the west of the paved area will constitute an adverse effect to the site. Along U.S. Route 220, Cummings Site 3 will be subject to adverse effects if earth moving or disturbing activities will extend beyond the Pennsylvania Department of Transportation fence. The area between this fence and the U.S. Route 220 embankment has been extensively disturbed by construction of a toe-drain at the base of the embankment, and has little cultural resource preservation potential (Mr. Robert Yowell, personal communication).

If levee construction will affect Cummings Site 3, it is recommended that Phase II testing be conducted at the site to determine eligibility for inclusion on the National Register of Historic Places. This testing should involve a combination of controlled surface collection to identify high artifact density areas, test unit excavation to retrieve representative artifact samples, and plow zone stripping to reveal features. At a minimum, five 2 m x 2 m (6.5' x 6.5') test units should be completed within high artifact density areas, and approximately 500 m^2 (5400 square feet) should be mechanically stripped to reveal features.

10.2.3 Cummings Site 4 (36Cn174)

Based on presently available data, Cummings Site 4 consists of a low to moderate density lithic scatter equivalent in all salient respects to

Cummings Site 3 (see above, Sections 6.1.3.6, 6.2.1, and 8.6). For this reason recommendations concerning future work at Cummings Site 4 are similar to those for Cummings Site 3.

Since Cummings Site 4 extends along the U.S. Route 220 embankment, it is subject to project effects only if earth moving or disturbing activities will occur beyond the Pennsylvania Department of Transportation fence. In this event, it is recommended that Phase II research at the site be conducted to determine National Register eligibility. As at Cummings Site 3, this research should include controlled surface collection, test unit excavation, and plow zone stripping. At a minimum, five 2 m x 2 m (6.5' x 6.5') test units should be completed within high artifact density areas, and approximately 500 m^2 (5400 square feet) should be mechanically stripped to reveal features.

10.3 Recommendations for Phase III Data Recovery

10.3.1 Crissmans Site 2 (36Cn167), Crissmans Site 3 (36Cn168), Crissmans Site 4 (36Cn171), Crissmans Site 5 (36Cn172), Cummings Site 2 (36Cn169), and Cummings Site 5 (36Cn177)

Phase II research was conducted at Crissmans Sites 2-5 and Cummings Site 2 during the present study, and all were found to be ineligible for inclusion on the National Register of Historic Places (see above, Sections 6.1.3.5, 6.1.3.6, 6.2.6, 8.3, 8.4, and 8.5). Regardless of project effects, no additional research at these sites is recommended. Phase I research was conducted at Cummings Site 5, and again indicated that the site was not eligible for inclusion on the National Register of Historic Places (see above, Sections 6.1.3.6, 6.2.1, and 8.8). No additional research at this site is recommended.

10.3.2 Island View Site (36Cn166)

The Island View Site should be considered eligible for inclusion on the National Register of Historic Places based on the information it contains. The proposed levee alignment will pass through this property, and will almost certainly destroy the small remnant of the site that presently remains intact. Unless an alternative alignment is selected, it is therefore recommended that data recovery be conducted at the Island View Site.

Data recovery at the Island View Site should be designed to recover the culture-historical and perhaps paleo-botanical data contained within the prehistoric site component. To this end, it is recommended that two block excavations be completed within the site--one situated between the localities of Units 1 and 3, and the other located between Units 2 and 3. Both block excavations should measure 4 m x 10 m (13' x 33'), and be continued to the base of cultural-bearing deposits. Excavation of blocks should be preceded by mechanical removal of the disturbed historic deposits capping the site and by excavation of at least four 2 m x 2 m (6.5' x 6.5') test units in each block to provide stratigraphic control. Excavation of

blocks should occur within 2 m x 2 m (6.5' x 6.5') excavation squares, and should proceed by arbitrary levels no thicker than 5 cm (2"). Every attempt should be made to define natural soil zones, and to excavate 5 cm (2") arbitrary levels within these zones.

Following excavation, appropriate techniques should be used to analyse the culture historical and perhaps paleo-botanical data recovered from the site. Projectile point and ceramic typology, lithic raw material analysis, analyses of assemblage function, and flotation processing and analysis of feature contents should be completed. The results should be integrated into coherent models of culture-historical and (perhaps) environmental/subsistence changes as represented at the Island View Site.

11.0 REFERENCES

Bebrich, C.A.

1971 Prehistory at Sheep Rock Shelter: A Study in the Systematics of Lithic Artifact Analysis. M.A. Thesis, Department of Anthropology, The Pennsylvania State University, University Park.

Bliss, G.S.

1941 Supplementary Climatic Notes for Pennsylvania. In: Climate and Man: Yearbook of Agriculture, U.S.D.A., Washington, D.C., pp. 1097-1098.

Braun, E.L.

1974 Deciduous Forests of Eastern North America., Hafner (Facsimilie of 1950 edition). New York.

Bressler, J.P.

1978 Excavations of the Bull Run Site in Loyalsock Township, Lycoming County, Pennsylvania. Valerie's Lettershop. Williamsport.

Broyles, B.J.

1971 Second Preliminary Report: The St. Albans Site, Kanawka County, West Virginia. West Virginia Geological and Economic Survey, Report of Archaeological Investigations, No. 3. Morgantown.

Coe, J.L.

1964 The Formative Cultures of the Carolina Piedmont. Transactions of the American Philosophical Society, Vol. 54, Pt. 5, Philadelphia.

Doutt, J., C.A. Heppenstal, and J.E. Guilday

1973 Mammals of Pennsylvania. Harrisburg: Pennsylvania Game Commission.

Eveland, J.R.

1973 Population Dynamics, Movements, Morphology, and Habitat Characteristics of Black Bears in Pennsylvania. M.A. Thesis, Department of Wildlife Management, The Pennsylvania State University, University Park.

Funk, R.E.

1976 Recent Contributions to Hudson Valley Prehistory. New York State Museum and Science Service Memoir 22. New York, The State Education Department, Albany.

Hatch, J.W.

1980 The Fisher Farm Site, A Late Woodland Hamlet in Context. Occasional Papers in Anthropology, Number 12. Department of Anthropology. The Pennsylvania State University. University Park.

Hay, C.A. and I.C. Beckerman

1985 Archaeological Excavation at the Clarks Ferry Bridge Site (36Da126) Dauphin County, Pennsylvania. Report prepared for Greiner Engineering Sciences Inc., by Archaeological and Historical Consultants, Inc., Boalsburg, PA.

Hay, C.A. and M.A. Graetzer

1985 Excavations at the Jacks Mill Site (36Ce230). Report prepared for T.R. Construction Company, Mifflintown, PA

Hay, C.A. and C.E. Hamilton

1984 The Bald Eagle Township Sewer Collection System Archaeological Project. The Pennsylvania State University, Department of Anthropology, Technical Report No. 2, University Park.

Hay, C.A., J.W. Hatch, and C.M. Stevenson

1978 The Lock Haven Flood Protection Project Archaeological Resources Reconnaissance. Clinton County, Pennsylvania. Report submitted to U.S. Army Corps of Engineers, Baltimore.

Hay, C.A. and C.M. Stevenson

1982 National Register of Historic Places Inventory--Nomination Form for the Memorial Park Site (36Cn164). On file in the Bureau of Historic Preservation, Pennsylvania Historical and Museum Commission, Harrisburg.

1984 The State College By-Pass Archaeological Project--Final Mitigation Research. Report submitted to Erdman, Anthony Associates, Inc., Mechanicsburg, PA.

Kent, B.C., I.F. Smith, III, and C. McCann

1971 Foundations of Pennsylvania Prehistory. The Pennsylvania Historical and Museum Commission. Harrisburg.

Kordeck, W.S.

1973 An Investigation of the Structure, Stability, and Movements of Pennsylvania Black Bear with Particular Emphasis on Pike County. M.A. Thesis, Department of Wildlife Management, The Pennsylvania State University, University Park.

Linn, J.B.

1883 History of Centre and Clinton Counties, Pennsylvania. Philadelphia: J.B. Lippincott and Co.

Maynard, D.S.

1875 Historical View of Clinton County, from its Earliest Settlement to the Present Time. Enterprise Printing House, Lock Haven.

Michels, J.W. and I.F. Smith, III

1967 Archaeological Investigations of Sheep Rock Shelter Huntingdon County, Pennsylvania. Vol 1 and 2. University Park: The Pennsylvania State University.

Raber, P.

1985 A Comprehensive Plan for the Conservation of Archaeological Resources in Pennsylvania. Bureau of Historic Preservation, The Pennsylvania Historical and Museum Commission, Harrisburg.

Ritchie, W.A.

1971 A Typology and Nomenclature for New York Projectile Points. New York State Museum and Science Service Bulletin Number 384. Albany: University of the State of New York.

Sanborn Map Co.

1925 Lock Haven Including Mill Hall, Flemington, Woorich, Lockport, and Castanea, Clinton County, Pennsylvania. Insurance Map. Sanborn Map Company.

Sanborn-Perris Map Company

1896 Insurance Map of Lock Haven, Clinton County, Pennsylvania. Sanborn-Perris Map Company, Ltd.

Scheirer, R.S.

1969 The Productivity of Eastern Wild Turkey. M.A. Thesis, Department of Wildlife Management, The Pennsylvania State University, University Park.

Schindler, D.L., J.W. Hatch, C.A. Hay, R.C. Bradt

1982 Aboriginal Thermal Alteration of a Central Pennsylvania Jasper: Analytical and Behavioral Implications. American Antiquity 47:526-544.

Smith, I.F., III

1972 Multiple Field "Digs" Produce Many Important Finds. Pennsylvania Heritage 6:1, 4-6.

1976 A Functional Interpretation of Keyhole Structures in the Northeast. Pennsylvania Archaeologist 46:1-12.

Snavely, A.N.

n.d. Prehistoric Human Populations in Piedmont North Carolina: An Archaeological Study. -Ph.D. Dissertation, Department of Anthropology, The Pennsylvania State University, University Park (In preparation).

Socolow, A.A.

1960 Geologic Map of Pennsylvania. Commonwealth of Pennsylvania, Department of Environmental Resources. Topographic and Geologic Survey. William and Heintz Map Corporation. Washington, D.C.

Taylor, W.P.

1956 The Deer of North America. Harrisburg: Stackpole.

Turnbaugh, W.H.

1977 Man, Land, and Time. Williamsport: The Lycoming County Historical Society.

U.S.D.A.

1966 Soil Survey of Clinton County. U.S. Department of Agriculture. Washington, D.C.

Webster, D., M. Aldenderfer, J.W. Hatch, and C.A. Hay

1977 The Milesburg Site: A Hunting Camp in Central Pennsylvania. Pennsylvania Archaeologist 47:37-47.

Witthoft, J.

1965 Indian Prehistory of Pennsylvania. Pennsylvania Historical and Museum Commission. Harrisburg.

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